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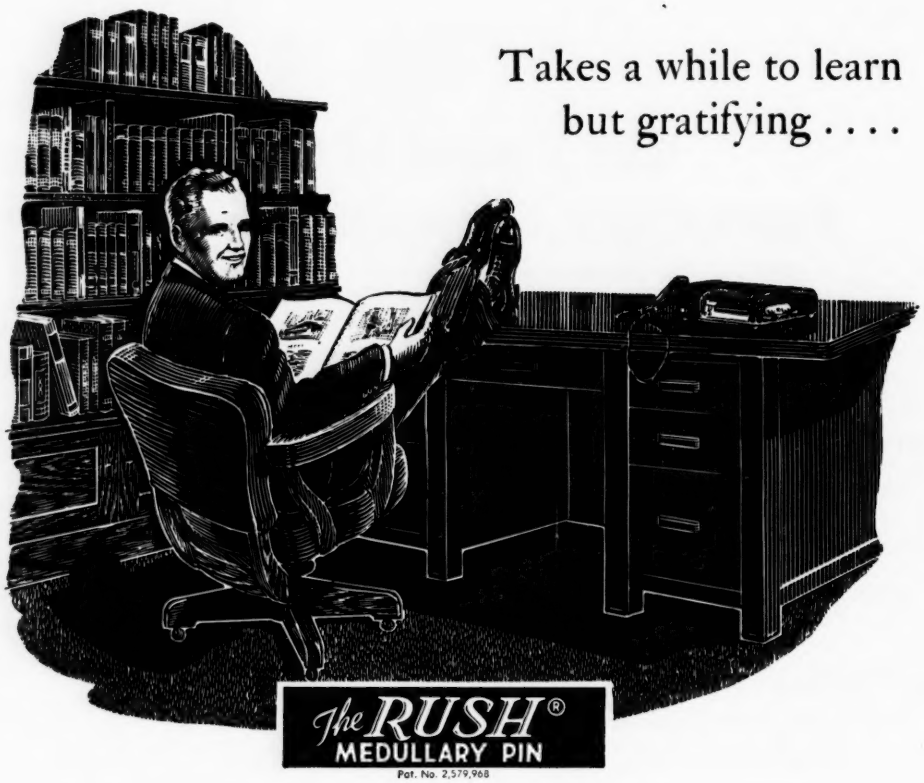

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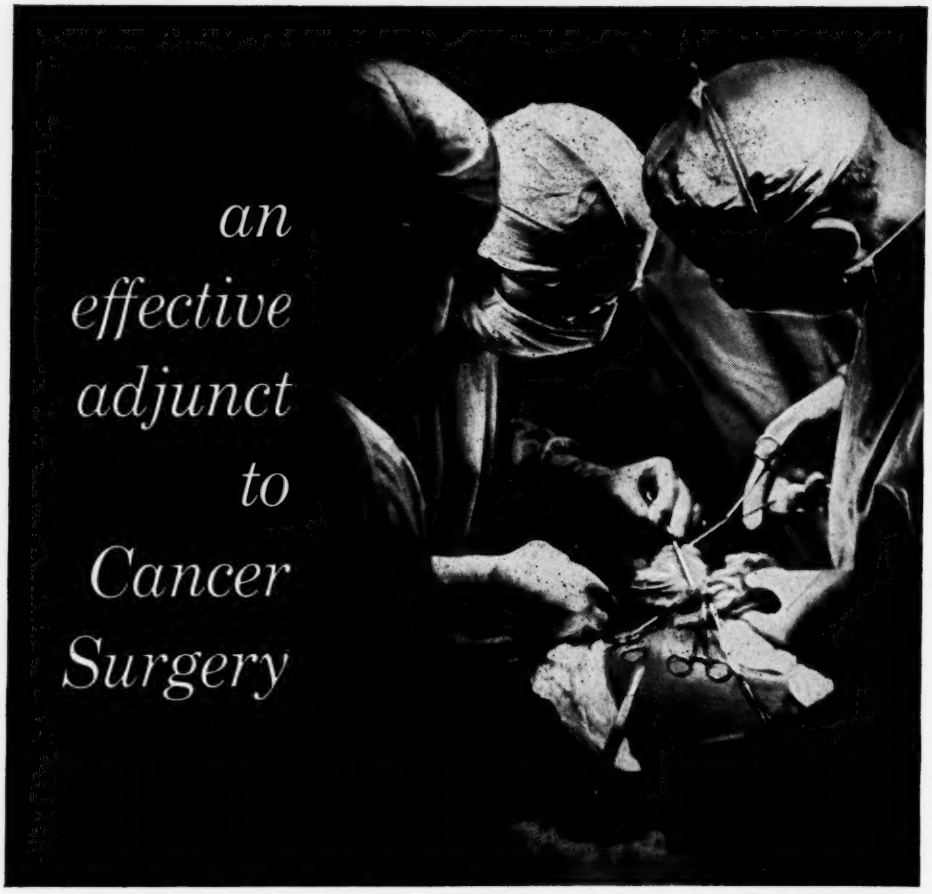

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General Surgery

Bleeding from the Upper Part of the Gastrointestinal Tract Secondary to Ingestion of Acetylsalicylic Acid (Aspirin)

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THE express purpose in the presentation of this review is (a) to emphasize the dangers associated with a rather innocuous drug that is used indiscriminately by a large proportion of the adult population in the United States and (b) to point out the important role of acetylsalicylic acid (aspirin) as a causative factor in the differential diagnosis of serious bleeding from the upper part of the gastrointestinal tract. The fact that acetylsalicylic acid is sold over the drugstore counter and that it is used in large quantities as a panacea in treatment of almost every common ailment makes it probably the most common household drug in use today. The rationale or basis for ingestion of these tablets does not follow any prescribed course of therapy; it is usually haphazard and without due consideration of dosage or the frequency of ingestion.

The actual chemical and therapeutic relation of sweet clover disease in animals and man is hypoprothrombinemia. It will be described in greater detail later. The important point to remember is that in both instances the breakdown production is salicylic acid from the conversion of 4-hydroxy-salicylates in aspirin ingested.

Submitted for publication Feb. 4, 1958.

History.—The investigations of Douthwaite and his associates[1] in 1938 marked the beginning of recent interest in aspirin (acetylsalicylic acid) and its effect on sensitive persons.

In 1939, Hurst and Lintott[2] reported their graphic observations, through a gastroscope, of the hemorrhage effect of aspirin on the sensitive stomach of a 57-year-old patient, who since the age of eighteen "had been liable to frequent and severe migraine headaches." For the relief of these, he had been in the habit of taking at least six tablets of aspirin per week and often as many as six a day. Gastroscopy was performed immediately after two aspirin tablets, broken but not crushed, had been swallowed. "Numerous particles could be seen adhering to the mucosa of the lesser curvature of the stomach and around many of these a zone of hyperemia was seen to develop. Around two larger fragments on the lesser curvature, actual extravasation of blood occurred."

In 1943, Link et al.[3] reported that the chemical agent responsible for the hemorrhagic Sweet Clover Disease in animals is 4-hydroxy-Coumarin and that it exerts its hypoprothrombinemic effect through its conversion in the body to salicylic acid (see diagram).

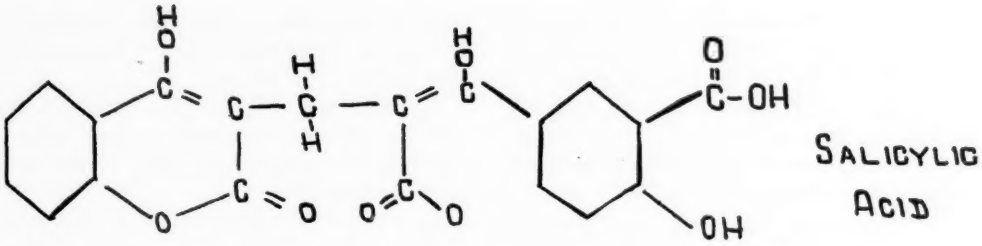
That same year, two clinicians[4] confirmed the hypothesis that salicylates produce a hypoprothrombinemia in man as well.

Shapiro and his associates[4b] noted that 8 Gm. of sodium salicylate produced a prolongation of prothrombin and coagulation times in both cirrhotic and normal subjects. They also observed that the prothrombin time in normal persons, when adequate doses of vitamin K were given prior to the salicylate, remained substantially normal. Given the same dose of vitamin K, however, cirrhotic persons were susceptible to the hypoprothrombinemic effect to the same degree as they had been without vitamin K protection.

Acetylsalicylic acid did not affect the prothrombin time of normal persons when given in doses of 4 Gm. per day. When 4 Gm. of acetylsalicylate and 50 mg. of dicumarol (3, 3, 4-hydroxy-Coumarin) were given together daily to 1 cirrhotic and 2 normal subjects, the prolongation of prothrombin time was twice as great in the former.

Shapiro and his co-workers[4b] further reported that in man, as Link had observed in the rat, acetylsalicylic acid (aspirin) seems to be more potent than the sodium salt. Moreover, the aforementioned data suggested that some form of disease of the liver must be present before average doses of aspirin will cause a bleeding diathesis. This conclusion was later expressed by Bernard and his associates.[5]

Meyer and Howard[4a] claimed that they could "consistently produce alterations in man with ordinary doses of salicylates through repeated administration." They also mentioned, in passing, that salicylates cause increased excretion of ascorbic acid in human beings and animals, as has been reported by Daniels,[6] Samuels,[7] and Ritz.[8] Could this phenomenon also account, in part, for the hemorrhagic consequences of aspirin ingestion in unfortunate persons? It is a well-known fact that "lack of vitamin C," as observed, for example, in scurvy, causes deterioration of capillary walls with resulting hemorrhages in mucous surfaces.[9] The studies of Ritz and Samuels seemed to indicate that a redistribution of ascorbic acid takes place in the body of a rat with the administration of salicylates. The brain and liver showed an early decrease, even in the absence of kidneys, to allow spillover into the urine. With continued administration of salicylates, other organs, including the adrenal glands, showed a decrease.



SALICYLIC ACID

As was reported by Kolchner[10] and Van Cauwenberge,[11] we have shown that the therapeutic effect of salicylates depends on stimulation of the adrenal cortex by adrenocorticotropin and that the effect is proportional to the dose. On the basis of this information and that set forth above, a hypothesis could be formulated that an initial response to salicylates is stimulation of the adrenal cortex. It is a well-known fact that ascorbic acid is metabolically involved in the buildup of the adrenocortical steroids. One could say with some degree of assurance, therefore, that, as this stimulation is brought about by salicylates, the ascorbic acid stored in the adrenals is used up. To replenish the supply, the first reaction of the body seems to be to deplete other organs of their stores, i.e., the brain and liver, as has been mentioned.

If the administration of salicylate is continued, the adrenals themselves commence to become depleted. According to Samuels,[7] "when salicylates are repeatedly administered at intervals of twelve hours, excretion (of ascorbic acid) continues to increase slowly for two or three days after the first sharp rise. It then levels off and usually shows a small decrease during the rest of the administration period. An approach to equilibrium between increased formation and increased excretion is seen here. The former did not quite offset the latter, however, as there was a slow decrease in excess excretion as time went on."

The general depletion is secondarily counteracted by increased synthesis of ascorbic acid. In the rat, i.e., it has been found that ascorbic acid can be synthesized from dextrose and glucuronic acid.[12] Apparently, this synthesis goes on in many places in the body and swells the blood content of ascorbic acid, leading to "spill-over" into the urine.

One is then faced with the question: What is the cause of hemorrhage associated with the ingestion of aspirin? Is it hypoprothrombinemia, or a decrease in ascorbic acid stores leading to capillary fragility? Smith and MacKinnon[13] supported the latter cause as well as the former. Frick[14] and Solem[15] lent strong support to the idea of increased capillary fragility as the main contributing factor. Frick contended that, since the prothrombin time in 2 out of 3 of his patients was normal and the platelet count was normal, one must assume that this phenomenon (hemorrhage) was the result of increased capillary fragility. He went on to say that a pronounced effect on these clotting factors (as opposed to capillary fragility factors) is observed only with large and repeated doses of salicylates. The degree of prolongation of the prothrombin time occasionally encountered with commonly used doses of these drugs is not sufficient, as a rule, to account for the bleeding. He further suggested that "capillary fragility" to aspirin is a matter of individual sensitivity.

Pathologic Picture.—Muir and Cossar[16] studied directly the effect of aspirin on the stomach by giving two uncrushed 5 gr. (0.32 Gm.) aspirin tablets, with a little water, to a series of patients approximately two hours prior to gastrectomy for peptic ulceration.

In 12 patients, microscopic evidence of mucosal irritation was present in the form of acute gastritis. The mucosa was congested and edematous, with flakes of adherent mucus containing aspirin fragments and often altered blood. Multiple erosions were visible to the naked eye in 5 and microscopically in all. Histologically, polymorphonuclear and round-cell infiltration was observed, together with the glandular erosion. The picture was typical of acute gastritis. In 3 specimens in which the reaction was severe, the aspirin left in the stomach was in large sections and the mucosal reaction was noticeably poor.

Individual Sensitivity.—As Frick[14] suggested, the degree of sensitivity to aspirin may be an individual trait. To give an example of hypersensitivity, let us refer to the case presented by Muir and Cossar[16] of the professional trackman, who had given up running because after each of his last three races he had vomited blood. It turned out that the only occurrence that was out of the ordinary before these three races was his ingestion of some tablets recommended by a fellow trackman, who had found that they accorded him relaxation before the races. These tablets contained salicylates, and the compound was eventually designated, by process of elimination, as capable of causing hematemesis in the first runner. This man had never taken aspirin before in his life, to his knowledge.

Thus, there seem to be two main types of sensitivity to aspirin. One type response is the alteration in prothrombin levels of the blood due to prolonged ingestion of salicylates. The other is actually a form of hypersensitivity, which may be due to such factors as:

1. Depletion of ascorbic acid stores (which occurs quite rapidly after salicylate administration, according to Samuels and his associates[8]).
2. Decreased adhesiveness of thrombocytes.
3. Defective production of gastric mucus.
4. Excess production of gastric hydrochloric acid, which does not cause overt signs or symptoms until triggered by the advent of salicylates into the already aggravated gastric mucosa.

Of the 12 instances of high gastrointestinal hemorrhage secondary to ingestion of aspirin studied in this paper, only 4 will be reported in some detail.

REPORT OF CASES

CASE 1.—T. R., a white man aged 40, an attorney, had hematemesis and tarry stools for two days in July 1955. He was examined roentgenographically at that time, and the results were negative. The same sequence of events occurred in November. In March 1956 he was admitted to a hospital with the same symptoms. Roentgenograms were once again taken and revealed no abnormality. The patient was kept in the hospital for two weeks on a "starvation diet" (patient's words) and then released. In April 1957, the patient noticed that he was once again passing tarry stools. Roentgenograms were normal. For three weeks prior to this episode he had been taking aspirin (acetylsalicylic acid) for bursitis of the right shoulder. The patient had been taking aspirin habitually, many times, for headaches. He reported that he had noticed epigastric distress each time.

The diagnosis was therefore postulated as aspirin sensitivity; all compounds containing salicylates were withheld. At no time since then has the patient had a recurrence of gastric hemorrhage. During the acute phase of the bleeding, the prothrombin time was reported as 19 seconds (control 14 seconds), or 70 per cent of normal. The hemoglobin level had dropped to 9.5 Gm. and the hematocrit reading to 29 per cent (71 per cent plasma).

CASE 2.—H. B., a 36-year-old white man, had an essentially normal past medical history. On Jan. 13, 1950, the day before admission to the hospital, he noticed some slight abdominal discomfort, for which he took a dose of Alka-Seltzer. The next day he began to have crampy diarrhea and noticed that the stools were black (tarry). He became progressively weaker and collapsed in the street. On admission to the hospital, his general appearance was that of a well developed man weighing 220 pounds (99.8 Kg.). He was pale (yellowish) and perspired freely. The pulse was very rapid. There was tenderness over the entire abdomen. The red blood cell count was 3,100,000 per cubic millimeter and the value for hemoglobin 55 per cent. Roentgenograms taken of the gastrointestinal tract were normal. The diagnosis was gastric hemorrhage caused by aspirin in the Alka-Seltzer. The patient stated that in his opinion his condition was due to the ingestion of Alka-Seltzer for, as he stated, prior to that time he had been in good health. After three days of hospitalization he was discharged home and has since had no signs or symptoms of gastrointestinal distress. He was warned by his physician to avoid aspirin in any form.

CASE 3.—A. F., a white woman aged 20, had been well and working up until two weeks before admission to the hospital, when she noticed slight distress in the upper part of the gastrointestinal tract, unrelated to meals. During this time she had been taking aspirin, two tablets in the morning and two in the evening. She vomited large quantities of blood on admission to the hospital. She became progressively pale and weak and went into mild shock. At no time did she have any abdominal pain. Physical examination revealed her to be slight (110 pounds, or 49.9 Kg.). She was in considerable distress, complaining of dizziness and weakness. There were no abdominal masses. The red blood cell count was 3,490,000 per cubic millimeter, with 70 per cent hemoglobin; the white blood cell count was 11,300 per cubic millimeter. Roentgenograms were taken of the entire gastrointestinal tract and revealed only a slight prominence of the gastric mucosa. The patient became progressively worse, her condition necessitating 11 transfusions. Repeat roentgenograms were taken and again failed to reveal any ulcer crater or neoplasm. In spite of this, operation was decided upon and a subtotal gastrectomy was done. No ulcer crater or neoplasm was palpated during this procedure. The surgeon stated that the gastric wall and mucosa resembled "wet blotting paper." The mucosa oozed blood. On the third postoperative day the patient began to go downhill rapidly, and a second operation (gastrotomy) was done to control secondary bleeding. After this second operation she made slow but steady recovery. Pathologic study of the gastric specimen revealed no neoplasms or ulcers. The mucosa of the specimen was swollen and hyperemic. The pathologist's discharge diagnosis was hemorrhagic gastritis and its most probable cause—aspirin. The patient was cautioned by her physician not to take aspirin in any form, and since that time has been completely well.

CASE 4.—C. C., a white man aged 38, was admitted to the hospital with a diagnosis of massive gastric hemorrhage. The family history revealed that his father had died of a pulmonary embolism and that his mother was alive and well, with a slight elevation in blood pressure. There were 5 siblings, all in good health. He had been admitted to the hospital in 1950 for hematemesis. Roentgenograms were taken and were reported as normal. The chief complaint was of weakness and shortness of breath. He was sweating profusely and stated that he had been having numerous black tarry stools. For three or four days prior to admission he had noted black streaks in his stools. He had mild epigastric distress, but there was no vomiting and no appearance of bright red rectal blood. Two gastrointestinal series failed to reveal any ulcer crater or neoplasm. In spite of the negative results from roentgen study, surgical intervention was decided upon, and a partial gastrectomy and vagotomy were done. The pathologic diagnosis was (a) normal nerve tissue; (b) phlebothrombosis of a medium-sized vein, and (c) an essentially normal gastric specimen. The patient had a 75 per cent hemoglobin level, and his hematocrit reading was 39 per cent. He was discharged with a diagnosis of massive gastrointestinal bleeding probably caused by ingestion of aspirin.

The remainder of the patients, who are not described in detail were predominantly male. Suffice it to say that not one of them was further troubled with gastric hemorrhage once the causative factor

became known and the use of aspirin was discontinued.

SUMMARY

A series of 12 cases of aspirin sensitivity is presented. In 6 of these cases the condition was apparently the result of prolonged aspirin therapy. In the other 6 there were true examples of hypersensitivity. Emphasis is placed on the close relation of sweet clover disease in animals to gastric bleeding in man, secondary to aspirin sensitivity. It is pointed out that, in the differential diagnosis of bleeding from the upper part of the gastrointestinal tract, hypersensitivity to aspirin should be considered. Emergency subtotal gastrectomy can and should be avoided when aspirin is known to be the causative factor.

There are two types of reaction in patients with sensitivity to aspirin: (a) alterations in the prothrombin level and (b) depletion of ascorbic acid stores, with subsequent increased capillary fragility and lack of adhesiveness of platelets.

RÉSUMÉ

Une série de douze cas d'intolérance à l'aspirine est décrite. Dans 6 cas l'état des malades résultait d'une cure prolongée; dans les 6 autres cas il s'agissait d'une intolérance vraie.

L'auteur souligne le rapport étroit entre les symptômes de l'affection provoquée par le mélilot chez les animaux et l'hémorragie gastrique chez l'homme allergique à l'aspirine. Il attire l'attention sur le fait que lors du diagnostic différentiel d'une hémorragie provenant de la partie supérieure du tractus gastro-intestinal, il faudrait toujours songer à une intolérance éventuelle à l'aspirine, car dans ces cas la gastrectomie subtotale d'urgence peut et doit être évitée.

Deux types de réactions sont conseillés: a) modification du niveau de prothrombine, b) épuisement des réserves d'acide ascorbique, entraînant une fragilitê capillaire accrue et un défaut d'agglutination des thrombocytes.

RESUMEN

Se presentan 12 casos de sensibilidad a la aspirina; en 6 de ellos la sensibilidad era aparentemente el resultado de la terapia prolongada con aspirina, y los otros 6 casos constituyen un verdadero ejemplo de sensibilidad.

Se hace notar la estrecha relación entre la enfermedad de los animales por la alimentación exclusiva de trébol dulce y las gastrorragias en el hombre secundarias a sensibilidad a la aspirina. Se señala que en el diagnóstico de las hemorragias de la parte alta del aparato digestivo no debe olvidarse la sensibilidad a la aspirina. Con ello puede llegar a evitarse en algún caso una gastrectomía subtotal de urgencia.

Hay dos tipos de reacción en los enfermos con sensibilidad a la aspirina: a) alteración del nivel de protombina y b) vaciamiento de las reservas de ácido ascórbico con subsiguiente aumento de la fragilidad capilar y falta del poder adhesivo de las plaquetas.

ZUSAMMENFASSUNG

Es wird über eine Reihe von zwölf Fällen von Aspirinüberempfindlichkeit berichtet. In sechs von diesen Fällen war die Erkrankung offenbar die Folge ausgedehnter Aspirinbehandlung. In den anderen sechs handelte es sich um echte Fälle von Überempfindlichkeit.

Es wird hervorgehoben, dass die Magenblutungen beim Menschen als Folge von Aspirinüberempfindlichkeit eine enge Beziehung zu gewissen Erkrankungen der Tiere beim Genuss von süssem Klee aufweist. Es wird darauf hingewiesen, dass bei der Differentialdiagnosse von Blutun-

gen aus dem oberen Magendarmkanal die Aspirinüberempfindlichkeit berücksichtigt werden sollte. Wenn Aspirin als ursächliches Moment erkannt wird, lässt sich die Notoperation einer subtotalen Magenresektion vermeiden.

Bei Patienten mit Aspirinüberempfindlichkeit lassen sich zwei Reaktionsformen unterscheiden: a) Veränderungen des Prothrombinspiegels und b) Erschöpfung des Vitamin C-Vorrats mit nachfolgender Erhöhung der Kapillarbrüchigkeit und mangelnder Heftfähigkeit der Blutplättchen.

RIASSUNTO

Viene presentata una serie di 12 casi di intolleranza all'aspirina. In 6 di essi l'intolleranza era probabilmente dovuta ad una prolungata terapia aspirinica, mentre negli altri si trattava di una vera ipersensibilità.

Viene sottolineata la stretta somiglianza che esiste fra la malattia da trifoglio dolce degli animali e le emorragie gastriche nell'uomo che conseguono all'intolleranza aspirinica. Quest'ultima condizione deve essere tenuta presente nella diagnosi differenziale delle emorragie digestive, in modo da evitare di resecare uno stomaco quando la causa del sanguinamento sia l'aspirina.

Le alterazioni consecutive alla aspirina nei pazienti intolleranti a questo farmaco sono di due ordini: 1) modificazioni del tasso di protrombina; 2) riduzione dei depositi di acido ascorbico con conseguente fragilità capillare e scomparsa del potere di agglutinazione delle piastrine.

SUMARIO

Apresenta 12 casos de sensibilidade à aspirina, sendo seis por terapeutica prolongada e os demais pela idiosincrasia. Salienta que essa ocorrencia deve ser lembrada quando se diagnostica um caso de sangramento gastro-intestinal, evitando-se assim uma intervenção desnecessaria. Cita 2 tipos de alterações hematicas na sensibilidade pela aspirina: 1- no nivel de protrombina; 2- redução das reservas de àcido ascórbico com subsequente aumento da fragilidade capilar e alterações dasplaquetas.

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The second "oldest profession" in the world is nursing, for this is really what the Mesopotamian priestesses did when they comforted and ministered to temple visitors. Medical history abounds with distinguished women who were nurses: the noble Fabiola who renounced wealth and pomp to attend the poor at the first hospital in Rome, which she founded; the Abbess St. Radegund de Poiters, daughter and wife of kings, who founded a convent and dedicated her life to nursing lepers; St. Hildegarde, Abbess of Bingen on the Rhine, who consecrated her life to medicine; Trotula, Rebecca, Abella, and the other "ladies of Salerno"; St. Clare, founder of the Franciscan order of "Poor Clares"; Elizabeth of Hungary, who was immortalized in paintings showing her carrying a basket of food for the poor that turned miraculously into roses when she was surprised by her irate husband, and who was founder of the "Gray Sisters," thus called because St. Francis of Assisi gave her his threadbare gray cloak; the Dominican St. Catherine of Sienna, heroine of the Black Death and patron saint of nurses; and many others down to the lay saints of our times, among whom Florence Nightingale so nobly stands out.

Woman's participation in medicine has changed with the evolution of the profession. In ancient and medieval times, woman's contribution to medicine was taking care of the sick; today she also helps the physician. With diligence, dignity, and authority she labors in offices, hospitals, laboratories, statistical departments, technical auxiliary services, administrative offices, complex communication systems, and many other areas of vital importance to the physician and medical progress. Perhaps in no other profession has woman established herself with as much dignity and authority as in the medical profession.

—*Marti-Ibanez*

Trusses Required During the Ambulant Injection Repair of Inguinal Hernias

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THE construction and application of the two trusses required for complete support of an inguinal hernia during the ambulant injection repair *(J. Internat. Coll. Surgeons* 29:8 [*Jan.*] *1958)* will be described in detail in this article.

One of the most important prerequisites of the ambulant injection method of managing selected cases of inguinal hernia in the male is the proper fitting of a truss. Not only must it be comfortable to the patient, but it must maintain reduction of the hernial contents at all times until the injection treatment has been completed. In 1937, McKinney[1] made the statement, "Too much emphasis has been placed on the injection solution and not enough on a proper fitting truss." I fully agree with McKinney and therefore have spent much time and effort in trying to develop a truss that seems to fulfill all requirements.

First of all, it is known from experience that the wearing of an elastic truss while the patient is up and about can, in time, produce an increase in the size of the hernia, help to create adhesions and even, possibly, cause strangulation of the hernia. Harris and White[2] stated, "This is due to the fact that the inguinal pad is drawn down against the pubic bone by the perineal strap, leaving the upper part of the canal unprotected and consequently occupied by the hernia. A hernia held in this fashion at the external ring is sure to increase in size. This type of truss would be more satisfactory (for day wear) if the pelvis were entirely round, but since the transverse diameter of the pelvis is one third larger than the anteroposterior diameter, this type of truss is thoroughly unscientific." I fully concur.

Experimentation with all sizes and shapes of inguinal pads revealed that an elongated ovoid one made of high density foam rubber and with beveled edges is highly satisfactory. The pad is covered with two very thin layers, the inner one being flannel and the outer one tricot. The pad can be easily cleansed without damage. It must fit the entire length of

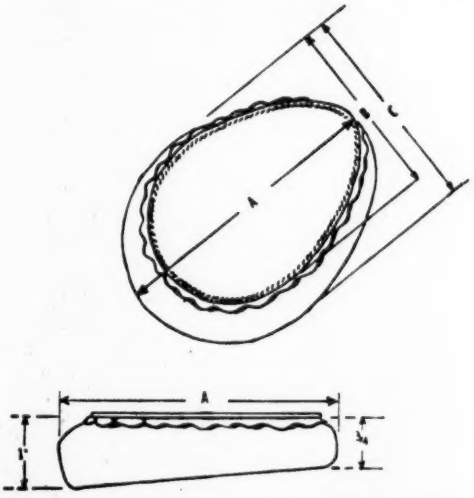

Fig. 1.—Inguinal pad. In upper drawing line *A* is 4 inches (10 cm.) in actual length; line *B* is 2½ inches (6.2 cm.) long, and line *C* measures 3 inches (7.5 cm.). Lower drawing (view showing depth of pad) repeats line *A*. Pad is 1 inch (2.5 cm.) thick at lower end (shown on left) and ¾ inch (1.9 cm.) thick at upper end (shown on right).

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Fig. 2.—Anterior, lateral and posterior views of unilateral truss in use.

the canal anatomically, with its medial end fitting over the pubic bone and just lateral to the base of the penis. This is most important, because the first four to six injections usually close the external ring completely. The granulomatous tissue formed seems to fuse this area to the pubic bone and therefore requires the constant pressure of the inguinal pad until completion of the treatment. The medial end of the pad is 1 inch (2.5 cm.) thick and is beveled in its entire length, so that the end fitting over the internal ring is ¾ inch (1.9 cm.) thick. The majority of the patients treated by the ambulant treatment have had a Malgain's line of 13 cm. long. This is a line drawn between the anterior superior spine of the ilium and the pubic spine and represents the position of the underlying Poupart's ligament.

In about 80 per cent of the cases of hernia so treated, Malgain's line measured between 12 and 15 cm., and for this group the No. 1 ovoid pad was used (see Figure 1). This pad is 10 cm. in length *(A)* and 7.25 cm. at its widest point *(C)*; it has an ovoid medium grade calfskin on its superior surface (B). Beneath this, and $\frac{1}{16}$ inch (0.16 cm..) in from the calfskin edge, an ovoid brass or galvanized iron plate, No. 14 gauge, 8.5 cm. in length and 6 cm. at its widest point, is sewn.

About 15 per cent of the patients had a Malgain's line between 9 and 12 cm. This group used the No. 2 pad, which is 9 cm. in length and 6 cm. at its widest point. The ovoid brass or galvanized iron plate in type No. 2 measures 7.5 cm. in length and 5 cm. at its widest point.

About 5 per cent of the patients had a Malgain's line above 15 cm., and this group required a pad 1 cm. longer than the No. 1 pad, designated as No. 3.

For very thin patients it was necessary to remove a small piece of the inferior surface of the medial end of the pad, so

that it comfortably fitted over the pubic bone. If the buttocks are flat, it usually is necessary to build up the anterior surface of the posterior part of the truss with felt and sponge rubber. This reinforcement prevents the posterior part of the truss from moving up and down when the patient moves in different directions.

Experimentation with all types of truss frames revealed that my semirigid one was decidedly satisfactory for the ambulant method. In a right inguinal hernia, the framework of the truss first starts by horizontally bisecting the inguinal pad, which conforms to the obliquity of the inguinal canal. It then flares upward and lateralward to the neutral point between the iliac crest and the trochanter of the femur, which is above the active muscles of the thigh and below those of the abdomen. The frame is made of phosphor-bronze and silver. It has a little spring and an inner covering of calfskin for hard wear. The truss then encircles two-thirds of the body posteriorly. In the "small of the back" it is connected to a 1½ inch (3.7 cm.) rubber webbing by means of an adjustable metal buckle. The remaining third of the body is encircled by this webbing and is attached to a small section of elkhide which fits onto the starting point of the framework. A piece of wool felt is sutured to the inner part of the juncture of the leather band and the elastic webbing. A perineal leg strap without any tension is next added to the truss. It is made of washable flannelette 1 inch (2.5 cm.) wide, which fits around the right leg and is sewn to a strip of elkhide that fits onto the metal protuberance over the center of the pad. The other end of the perineal strap is sewn to webbing ¾ inch (1.9 cm.) wide, which is comfortably attached posteriorly to the truss, as in the photographs (Fig. 2). The buckles allow for adjustments when needed. For a left inguinal hernia the directions are just the opposite to those for a right inguinal hernia.

In the treatment of the patient with bilateral inguinal hernias the same principles apply as with single hernia, except that the bilateral pads are attached to an anterior crossbar and the ends of the framework are about 4 inches (10 cm.) apart, posteriorly. These ends are held together by elastic webbing 1 inch (2.8 cm.) wide, sewn at each end to a small piece of elkhide that fits onto a protuberance on each end of the frame. Surrounding both hips makes the truss very stable, and the hernias are held reducible with a minimum of pressure.

Patients who are to be given the ambulant treatment must be conscientious and cooperative to insure the maximum success with this procedure. For a single hernia, they will be required to wear a semirigid or day truss while up and about and an elastic truss, with the same type of elongated ovoid pad, in bed. The elastic or night truss must be worn for two months as a protection to the patient if he has to get up to go to the bathroom or if he coughs or sneezes. As a precautionary measure during this time, he must change from his day truss to his night

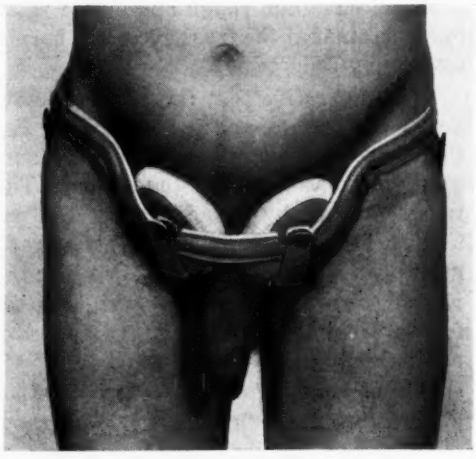

Fig. 3.—Bilateral truss in use.

truss while lying on his back. A patient with bilateral hernias is required to wear a bilateral rigid truss and a bilateral elastic truss. No tub baths are allowed until after the period covered by the first four to six injections. At the end of that period the external ring should be completely and tightly closed, and then the patient can have tub baths without any support. In the interim, sponge or shower baths are in order, taken in the morning with the night truss on. After the bath the elastic truss can be wrung out and hung up to dry, and then be ready to apply again that evening. Once the patient has learned to wear the truss properly, he may wear a light undershirt under it for cleanliness and to prevent skin reactions that may be caused by leather and perspiration.

Usually several adjustments are required the first week or two before the semirigid truss will fit properly and feel comfortable to the patient. Being sure that he is wearing his truss properly, the patient may then carry on his normal activities but should be cautious about doing heavy lifting. Occasionally, and as a double check, the surgeon should have the patient fully squat. While he is in this position, have him cough and strain so as to ascertain that the truss keeps the hernia completely reduced.

It is imperative that the surgeon know how to fit trusses, and it is most essential that there be cooperation between the surgeon, the trussmaker and the patient. The trusses can easily be adjusted if the patient gains or loses weight. The surgeon must always check on the way in which the patient wears the day truss each time before a treatment is given. Taking care of details is extremely important. It should be emphasized that trusses are not a substitute for definitive hernia therapy, whether by ambulant injection repair or surgical intervention.

SUMMARY AND CONCLUSIONS

Herein are described the two trusses needed to maintain reduction of an inguinal hernia during the ambulant injection repair.

Each truss must be individually fitted.

A semirigid truss must be worn during the day while patient is up and about.

An elastic truss must be worn in bed for two months, so as to keep the hernia reduced twenty-four hours a day while the granuloma is forming.

The features of the semirigid and rigid trusses that deserve emphasis are the shape and size of the inguinal pad and the manner in which the trusses are fitted to maintain constant upward pressure against the inguinal canal while the patient is in an erect position.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Es werden in der Arbeit die beiden Bruchbänder beschrieben, die während der Dauer der ambulanten Behandlung mit Einspritzungen benötigt werden, um die Leistenhernie reponiert zu halten.

Beide Bruchbänder müssen nach Mass angefertigt werden.

Während des Tages, wenn der Patient sich frei bewegt, muss ein halbstarres Bruchband getragen werden.

Wenn der Patient im Bett liegt, muss er zwei Monate lang ein elastisches Bruchband tragen, sodass der Bruch volle 24 Stunden pro Tag in Reduktion gehalten wird, während sich das Granulationsgewebe entwickelt.

Worauf es sowohl beim halbstarren als auch beim starren Bruchband besonders ankommt, ist die Form und Grösse des Leistenpolsters und die Anpassung der Bruchbänder, die einen ständigen nach oben gerichteten Druck gegen den Leistenkanal bei aufrechter Stellung des Kranken gewährleisten muss.

RIASSUNTO E CONCLUSIONI

Vengono descritti i due cinti necessari per mantenere la riduzione dell'ernia durante la terapia ambulatoria col metodo delle iniezioni. Ognuno di essi deve essere adattato caso per caso. Quello semirigido si porta durante il giorno quando il paziente è in piedi e cammina, quello elastico durante la notte, per un periodo di due mesi; l'ernia viene, pertanto, contenuta per tutte le 24 ore fino a che non si sia formato il granuloma cicatriziale.

Quello che conta nel cinto è la forma, lal dimensione e il modo di applicazione, e deve far in modo di mantenere una pressione costante contro il canale inguinale quando il paziente è in posizione eretta.

RESUMEN Y CONCLUSIONES

Se hace una descripción de los dos bragueros necesarios para la contención de las hernias durante el tratamiento esclerosante ambulatorio.

Cada braguero debe ser adaptado a cada enfermo.

Durante el día, cuando el enfermo esté de pie y andando, deberá llevar un braguero semirrígido.

Cuando esté en la cama se pondrá un braguero elástico durante dos meses, para conservar la hernia reducida las 24 horas del día mientras se forma el granuloma.

RÉSUMÉ ET CONCLUSIONS

L'auteur présente deux bandages herniaires pour maintenir la réduction de la hernie inguinale durant le traitement ambulatoire par injections.

Chacun des bandages doit être adapté individuellement. Durant le jour: bandage semi-rigide. Durant la nuit, et pendant deux mois: bandage élastique. Il est en effect nécessaire de soutenir la hernie pendant 24 heures sur 24 en attendant la formation de la granulation.

Ces bandages ont la dimension et la forme de la pelote inguinale. L'auteur décrit la façon de les adapter afin de maintenir une pression constante vers le haut contre le canal inguinal lorsque le malade est en position debout.

SUMARIO E CONCLUSOES

São descritas duas fundas necessarias para manter a redução de hernia inguinal durante o tratamento ambulatorio pelas injeções. Cada funda deve ser preparada para cada caso. Uma funda semi-rígida deve ser usada durante o dia, emquanto o doente deambula.

Uma funda elástica deve ser usada durante dois mêses quando o paciente se deita e frequentemente podem ser utilisadas em combinação para que se mantenha a redução durante 25 horas por dia.

As características dessas fundas são a forma e o tamanho do coxim e a maneira pela qual as fundas são mantidas de encontro ao canal inguinal durante a posição de pé.

Author's Note: I wish to acknowledge the invaluable assistance and cooperation of Mr. Ronauld L. Tremblay of the Vernon Surgical Shop, Springfield, Massachusetts, in the development and construction of the trusses described.

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Genitourinary Surgery

Leukoplakia of the Renal Pelvis

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LEUKOPLAKIA of the renal pelvis is a condition in which there is metaplasia of the transitional epithelium of the mucosa to the squamous type, with the formation of areas of cornified, thickened and elevated epithelium. This keratinization of the mucous membrane results in the formation of grayish white plaques in the renal pelvis.

The cause is unknown. Often the condition has been associated with inflammation, irritation or the presence of stone or infection. Wolbach and Howe observed keratinizing epithelium similar to leukoplakia in rats fed on a diet low in vitamin A. Low and Coakley, however, reported a case in which the diagnosis was made before operation, and in this case no infection or other disease was present. Most authors consider chronic infection or inflammation the most common cause of the disease.

Leukoplakia of the renal pelvis was first reported in the United States by Beer in 1914. In 1882 Ebstein reported the first case of leukoplakia of the renal pelvis in the literature. About twenty years before this, Rokitansky first reported the disease as occurring in the bladder.

Various terms have been used to describe this condition. Metaplasia, xerosis, cholesteotoma, leukoplakia, leukoplasia and pachydermia have all been used in the past.

Less than 100 cases of leukoplakia of the renal pelvis have been reported up to the time of writing. McCrea studied the records at the Philadelphia General Hospital from 1936 to 1948 and found no instance in 46,928 autopsies. Of 251,578 patients discharged from the hospital during these years, the diagnosis was not made in any instance. Kretschmer reviewed the literature in 1920 and collected 13 cases involving the renal pelvis. Hinman, Kutzmann, and Gibson collected 31 cases in 1924. They added 2 cases of their own. Kutzmann collected 68 cases up to 1929, and Taylor listed 72 cases in 1936. Since then Keesal and Rosner, Landes and Hamlin, Scholl, Falk, Senger, Bottone and Kelleher, Low and Coakley, McCrea, Abeshouse and Tankin, and Politono have reported from 1 to 3 cases each. Last year Abeshouse and Tankin carefully summarized the literature and Politono reported 3 cases of his own. Politono stated that in the cases of more than 7,500 autopsied patients and those of 288,887 patients discharged from Duke Hospital the diagnosis had not been made.

Leukoplakia of the renal pelvis has been reported in patients of all ages. The youngest, whose case was reported by Leber, was a child 4 months old. Albarron and Halle each reported on patients in the early seventies. In most cases re-

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Fig. 1.—Filling defect in left kidney, due to leukoplakia.

ported the age of the patient has been between 30 and 40 years.

Abeshouse and Tankin stated that the disease is more common in the female than in the male. Kretschmer found it more common in the male. Politono reported that it occurs with about equal frequency in the two sexes. Patch in 1948 made a survey of 152 cases of leukoplakia involving the urinary tract. The bladder was involved in 110 patients, the renal pelvis in 36 and the ureter in 6.

The diagnosis is seldom made before operation. As far as we have been able to determine, the diagnosis has been made preoperatively only four times. The patient may pass flakes of tissue from time to time, and this probably accounts for the common symptoms of renal colic and hematuria. Frequency and urgency of urination, pyuria and dysuria may be present. If the urine contains cornified squamous cells, leukoplakia should be the diagnosis.

The pyelogram shows a mottled appearance of the renal pelvis that is difficult to differentiate from the appearance of papillary carcinoma or tuberculosis.

The disease is usually unilateral, although a few cases of bilateral renal leukoplakia have been reported. Since the incidence of squamous cell carcinoma is high in association with leukoplakia and the disease appears incurable, nephrectomy is the treatment of choice for the unilateral condition. When it is bilateral, conservative management must be used and diet high in vitamin A together with pelvic lavage, has been used. Senger, Bottone, and Kelleher reported a case of bilateral involvement in 1951, and Helfert and Breman used ACTH in such a case, with good results.

REPORT OF A CASE

Mrs. E. M., a white woman aged 44, was admitted to the Halstead Hospital on April 3, 1956, with the chief complaint of repeated at-

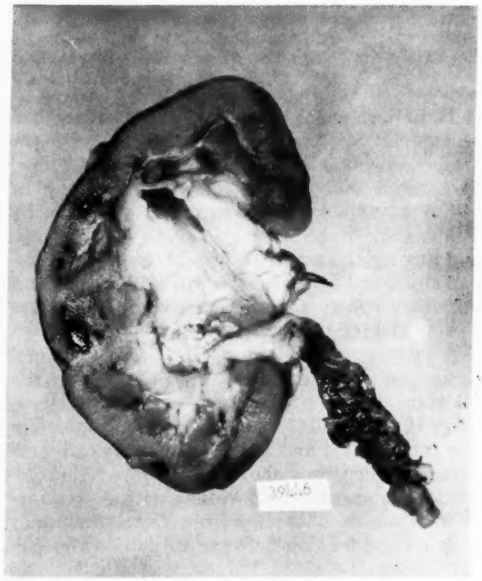

Fig. 2.—Cross section of left kidney. In lower calyx is a yellowish papillary mass measuring 17 by 6 mm. Its height is 5 mm. There is some extension of tumor into the adjacent pelvis.

Fig. 3.—Photomicrograph of papillary elevation of lesion (× 92). Squamous epithelium with stratum granulosum and thick corn layer covers fibrous stalk. Squamous cells are well differentiated and basement membrane is intact.

tacks of left renal colic associated with gross hematuria. She had the first attack seven years prior to admission and many attacks since. She stated that she had passed something in the urine which she thought was gravel. She complained of pain and burning on voiding, and during the acute attacks of renal colic she had chills and fever associated with nausea and vomiting. A systemic review and other data in the history were noncontributory.

A cystoscopic procedure was done on April 4, and no unusual signs were observed in the bladder. When pyelograms were made, however, the left kidney showed a filling defect in the renal pelvis and in the lower calyx. Intravenous pyelograms showed the same filling defect and a normal right kidney with good function. Culture of urine from the left kidney was reported as containing B. coli, while culture from the right kidney was sterile. No acid-fast organisms were present. Studies of the blood and serologic tests revealed no abnormality. A diagnosis of papillary carcinoma of the renal pelvis was made.

On April 5 a left nephrectomy was done. The postoperative course was uneventful, and the patient was discharged from the hospital on April 20, feeling quite well.

Pathologic Data.—Gross: The surgical specimen was a kidney weighing 175 Gm. The attached ureter was 8 cm. long. The surface was smooth. Cross section showed distinct markings. In the pelvis and adjacent inferior calyx there was a soft papillary grayish white mass that measured 17 by 6 by 5 mm.

Microscopic: Section of the kidney showed normal cortex. Occasional small groups of lymphocytes were seen. Sections from the pelvis at the site of the lesions showed squamous epithelium replacing transitional epithelium. The epithelium was composed of about eight rows of squamous cells. The lower cell border of the epithelial layer was distinct. A thick layer of cornified cells covered the surface, which showed infoldings but no true papillae. The white material in the calyx and pelvis was desquamated cornified squamous cells. In the

Fig. 4.—Higher magnification (× 292) of margin of leukoplakia showing cornified epithelium of lesion and normal transitional epithelium of pelvis.

subepithelial tissue were lymphocytes and a few eosinophilic leukocytes. The adjacent wall of the pelvis showed normal transitional epithelium.

Diagnosis: Leukoplakia of the renal pelvis and lower calyx.

SUMMARY

A case of leukoplakia of the renal pelvis is reported, and the history, etiologic factors, incidence, diagnosis and treatment of this condition are discussed. Since the incidence of squamous cell carcinoma following leukoplakia is high, nephrectomy is the treatment of choice when the condition is unilateral.

ZUSAMMENFASSUNG

Es wird über einen Fall von Leukoplakie des Nierenbeckens berichtet, und die Geschichte, die ursächlichen Faktoren, die Häufigkeit, die Diagnostik und die Behandlung der Erkrankung werden erörtert. Da das Auftreten von Schuppenzellkrebsen im Anschluss an eine Leukoplakie häufig vorkommt, bildet, wenn es sich um eine einseitige Erkrankung handelt, die Nierenresektion die Behandlung der Wahl.

RÉSUMÉ

Les auteurs exposent un cas de leucoplasie du bassinet et discutent l'évolution, les facteurs étiologiques, la fréquence, le diagnostic et le traitement de cette affection. L'incidence du carcinome à cellules squameuses après leucoplasie étant élevée, la néphrectomie est le traitement de choix lorsque cet état est unilatéral.

RIASSUNTO

Viene riferito un caso di leucoplachia della pelvi renale; di questa affezione vengono trattate l'etiologia, la frequenza, la diagnosi e la cura. La cura di scelta, nei casi unilaterali, è la nefrectomia, in considerazione dell'alta percentuale di trasformazioni maligne.

RESUMEN

Se presenta un caso de leucoplasia de la pelvis renal y se discuten la historia, los factores etiológicos, la frecuencia, el diagnéstico y el tratamiento de la afección.

Puesto que el carcinoma de células escamosas es muy frecuente asentando sobre la leucoplasia se considera la nefrectomía como tratamiento de elección cuando la lesión es unilateral.

SUMARIO

Refere um caso de leucoplasia da pelve renal e discute a hi storia, fatores etiologicos, incidência e diagnóstico assim como o tratamento. Levando em conta que a incidência do carcinoma baso-celular pós-leucoplasia é alta a nefrectomia é o tratamento de escolha quando a molestia é unilateral.

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While you are listening to the patient's story, your eyes and your ears are also summing him up. By the time he has finished the narrative you should have a good idea, not only of the trouble that has brought him to see you, but of what manner of man he is. This knowledge of human beings, call it garden psychology if you will, is a matter of first-rate importance, for it gives the touchstone which will help us to assess the value of the whole clinical picture. What is an ache to one man is an agony to another, and a degree of tenderness that will allow a confident diagnosis of appendicitis in a placid and sensible young woman may be of no significance in a neurotic and self-centered girl. We must, however, beware of labelling anybody as neurotic without careful consideration. Axel Munthe, in *The Story of San Michele*, refers to 'le malade au petit papier,' whose chief symptom is a list of complaints carefully written down, lest he forget even the smallest of them. These tabulated woes are usually imaginary, for real suffering requires no reminder. But it sometimes happens that the conscientious and self-effacing man who is really ill will come thus prepared, not because he wishes to present you with an imposing list of ailments, but because he is desperately anxious to avoid wasting your valuable time, and wishes to give his story in as consecutive and orderly a manner as possible.

—*Ogilvie*

Experience with Primary Closure After Suprapubic Prostatectomy

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HISTORY records that in 1836 Amussat first attempted the surgical removal of obstructing prostatic tissue. He used a suprapubic approach to remove the middle lobe. The procedure became technically feasible and was endorsed by McGill in 1887. As can readily be seen, however, removal of the middle lobe alone did not always permit adequate voiding, and because of this William White, in 1893, denounced prostatectomy and recommended castration as the treatment of choice for urinary obstruction.

Castration for prostatic hypertrophy was no more popular with the patient than with the surgeon, and in less than two years Fuller recommended return to surgical intervention if all lobes of the prostate were removed. The blind technic of this procedure was published in 1901 by Frey, and in 1916 Thomas and Walker of London added the technic for open visual prostatic enucleation.

The two-stage suprapubic prostatectomy was later observed to offer a lower mortality rate; this rate, however, was soon rivaled by that of the one-stage perineal technic and, still later, by that of the transurethral approach, the latter also adding a much shortened stay in the hospital.

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More recently, retropubic prostatectomy has become popular because it permits total enucleation with primary wound closure and thus involves an even shorter period of hospitalization than do the other open surgical procedures. The complications of osteitis pubis and the likelihood of serious bleeding from the plexis of Sanatorini prevented this operation from becoming universally popular.

Primary closure of the incision after suprapubic prostatectomy has been advocated for many years, but others, like ourselves, have been hesitant to adopt this procedure for fear of massive postoperative hemorrhage that would require a secondary operation for control.

With the advent of antibiotics and a better understanding of the renal physiologic aspects of prostatic obstruction, one-stage suprapubic prostatectomy with primary closure has recently become more popular, since it permits total enucleation of the prostatic adenoma by a simple operative procedure and results in a reduction of the time spent in the hospital.

We present this paper in an attempt to encourage others to use primary closure in suprapubic prostatectomy. It has proved entirely satisfactory to us during the past year in a series of 41 consecutive cases. We have not divorced ourselves from transurethral resection for small glands and for invasive, obstructive malignant glands, nor do we deny the use of radical perineal prostatectomy for

the operable prostate with malignant disease. If associated uremia and/or infection are present, the two-stage suprapubic procedure is still used to allow return of renal function before the second stage is attempted; we now use primary closure, however, at the time of the second stage without hesitation.

It is our firm conviction that a nonmalignant prostatic adenoma estimated to weigh more than 35 Gm. is more efficiently treated by complete suprapubic adenomectomy than by any other method, and that many of the pathologic conditions associated with benign prostatic hypertrophy will, unless corrected, continue to cause difficulties for the patient. In this regard, vesical calculi and vesical diverticula may be readily removed at the same suprapubic operation by which the prostatic adenoma is removed. In many patients in whom prostatic enlargement has led to chronic overdistention of the bladder and detrusor atonia, simple resection of the posterior portion of the urethra and the vesical neck alone does not always permit complete spontaneous evacuation of urine. In such cases if the patient is treated simply by transurethral resection, he may retain a large amount of residual urine, which too often then becomes secondarily infected. Such segmental atonia of the bladder is dramatically improved by segmental resection of the bladder at the same time prostatectomy is performed, and the suprapubic wound may be closed primarily.

The advocates of transurethral resection for the large benign prostatic adenoma can point with pride to the shorter period of hospitalization and the lower mortality rate associated with this procedure. For small glands or invasive, obstructive malignant glands, we agree, this is quite true. With the larger glands, however, transurethral resection of the prostate becomes a more formidable procedure that requires more operating time and, in some instances, more than one operative procedure to produce adequate voiding.

The operating time for the prostatectomy alone in the 41 cases herein reported has been much less than the gram-a-minnute cited by resectionists. In this series the average operating time for the entire surgical procedure has been only sixty-eight minutes, and, in addition to other procedures, an average of 53 Gm. of prostate has been removed.

The shorter postoperative stay in the hospital day is another factor that has caused the transurethral and retropubic procedures to gain favor. The suprapubic approach in prostatectomy formerly required a suprapubic tube, which was allowed to remain in place for two to seven days, varying with the individual surgeon and the patient's condition. Once the suprapubic tube was removed, a vesicocutaneous sinus remained, which was slow to heal and which added days to postoperative hospitalization. In this small series, in which primary closure has been used, the average postoperative course in the hospital has been unfavorably colored by complications in systems other than the urinary; if the complicated cases are deleted, however, the average postoperative stay becomes nine and one-half days.

Two deaths occurred in this series. One of the 2 patients was an 87-year-old man who died forty-four days after the operation. Death was attributed at postmortem to arterial sclerotic heart disease with congestive failure. The other was a 72-year-old patient who died on the twenty-sixth postoperative day. Autopsy revealed that death was due to a massive pulmonary embolus. Other complications encountered have been coronary occlusion, cerebral vascular accident, cholecystitis and postoperative psychosis.

The accompanying table lists the details of the 41 consecutive cases that make up this series.

The surgical technic of the suprapubic prostatectomy we employ offers no revolutionary procedures or changes; rather, it is a composite of the proved technics advocated by other urologists and thoroughly described by Dobson in his book *Urological Surgery*. The method we are employing at present is not exactly that with which this series was started; the changes we have made, however, were made to control some of the problems encountered in the earlier operations. The anesthesia we have chosen is spinal, sodium pentothal being administered intravenously when needed to patients who wish to be asleep or to those in whose cases apprehension might become a major problem. With spinal anesthesia, abdominal relaxation is more nearly complete and greatly facilitates the operation.

A bilateral ligation at the vas is routinely performed at the time an indwelling catheter is inserted or a cystoscopic procedure performed, or, if not done prior to the suprapubic prostatectomy itself, is done at the beginning of this operation. There is nothing unusual about the technic of vas ligation except that all sutures used are absorbable. After ligation of the vas the abdominal part of the operation is commenced. A Foley catheter is inserted into the bladder if it has not been used preoperatively for drainage. The bladder is distended with approximately 150 to 250 cc. of sterile saline solution, and the catheter is clamped. The cutaneous incision is made transversely, approximately 2 inches (5 cm.) above the superior margin of the symphysis pubis. It is carried directly downward until the external fascia of the rectus abdominis is encountered. Hemostasis is controlled with ties of No. 00 or No. 000 plain catgut or with the electrical surgical coagulation unit. A towel clamp is placed at the midline of the superior margin of the incision, and the superior skin edge is undermined to give adequate upward exposure of the rectus fascia. The rectus fascia is then divided in the midline, and the recti muscles are separated. By this means the suprapubic space is entered and the bladder identified. Two sutures of No. 2 black silk are placed one above the other in the dome of the bladder once the peritoneum has been reflected superiorly. The contents of the bladder are then evacuated through the Foley catheter, and the catheter is removed. A stab incision is made into the bladder itself; this incision is spread transversely by means of the fingers, and any remaining bladder contents are evacuated by means of a suction device. Little bleeding is encountered in splitting the detrusor fibers bluntly; if bleeding should occur, however, ties of No. 00 plain catgut are used promptly. Any calculi or diverticula present are removed prior to the prostatectomy, and both ureteral orifices are carefully identified prior to enucleation of the prostatic adenoma. In the event that the ureteral orifices appear to approximate a large overhanging lateral lobe of the prostate or a subtrigonal lobe, catheters are inserted in each ureter so that the ureter's location may be continually ascertained to prevent possible damage during the prostatic enucleation. A second surgical glove is placed on the operating surgeon, who then inserts two fingers into the patient's rectum. The manual dilatation of the anus by two fingers facilitates postoperative evacuation of flatus and aids in preventing postoperative abdominal distention. Adenomectomy of the prostate is started with blunt dissection, by breaking the mucosa in the cleft between the two lateral lobes superiorly at the level of the verumontanum. The adenomectomy

Data on 41 Consecutive Cases

Case	*Age of patient*	*Weight of Prostate (Gm.)*	*Operating Time (Min.)*	*Vas Ligation*	*Other Operative Procedures*	*Total Postoperation Hospital Days in*	*Complications or Associated Diseases*
1.	65	20	68	Yes	None	8	None
2.	75	29	90	Yes	Circumcision	24	Pernicious anemia, diabetes, pyelonephritis, postoperative psychosis
3.	74	71	75	Yes	Diverticulectomy	33	Coronary thrombosis 48 hrs. after operation
4.	80	86	100	Yes	Meatotomy	24	Vesicocutaneous fistula persisted 11 days
5.	58	22	140	Yes	Meatotomy: reinsertion of urethral catheter with bleeding and observation in O.R. for stabilization	19	Cholecystitis
6.	74	93	65	Yes	Diverticulectomy	8	None
7.	85	54	75	Yes	None	15	None
8.	78	64	75	Pre-op	None	13	None
9.	65	20	70	Yes	None	20	Parkinsonism; required post-operative Artane regulation
10.	70	22	80	Yes	None	11	None
11.	71	100	55	Yes	None	10	None
12.	66	70	67	Yes	None	36	Cholecystitis requiring cholecystectomy 16 days after operation
13.	72	61	47	Yes	None	8	None
14.	73	86	90	Yes	Circumcision	14	Vesicocutaneous fistula persisted 5 days
15.	65	46	51	No	None	11	None
16.	81	129	56	Yes	None	9	None
17.	87	30	58	Pre-op	None	44	Death on 44th postoperative day; DX,* arteriosclerotic heart disease with cardiac failure
18.	62	96	50	Yes	None	27	Preoperative and Postoperative renal insufficiency
19.	60	5	70	Yes	Diverticulectomy	8	None

Data on 41 Consecutive Cases—Continued

20.	65	22	45	Yes	None	9	None
21.	72	25	50	Yes	None	63	Cerebral vascular accident 72 hours postoperative
22.	61	12	72	Yes	Cystolithotomy	32	Diabetes detained after operation for insulin regulation
23.	68	23	50	Yes	None	12	None
24.	53	13	47	Yes	None	12	None
25.	61	18	51	Yes	None	8	None
26.	72	8	56	Yes	None	10	None
27.	68	69	60	Yes	None	10	None
28.	67	28	56	Yes	Diverticulectomy	8	None
29.	60	39	100	Yes	Segmental resection of bladder	8	None
30.	71	143	60	Yes	None	7	None
31.	87	115	80	Yes	(Subtrigonal prost)	10	None
32.	51	16	50	Yes	None	10	None
33.	66	51	70	Yes	None	10	None
34.	65	23	85	Pre-op	Rt. orchidectomy for preoperative epididymitis	18	None
35.	78	120	75	Yes	Cystolithotomy	10	None
36.	72	70	60	Yes	None	26	Death on 26th postoperative day; DX,* massive pulmonary embolis
37.	55	40	105	Yes	Circumcision and cystolithotomy	9	None
38.	70	25	60	Yes	Cystolithotomy and diverticulectomy	13	None
39.	65	126	48	Yes	Meatotomy	7	None
40.	56	44	45	Yes	None	10	None
41.	79	55	60	Yes	None	10	None
Average	69	53.6	67.5			15.7	

*Postmortem diagnosis.

is performed with care, sweeping motions of the fingers being used in the plane between the capsule and the adenoma itself. Great care should be taken to preserve the integrity of the external sphincter and the prostatic capsule, to avoid excessive bleeding. In the same manner, care at the vesical neck is also essential to prevent wide lateral tears. Gentle counterpressure by the fingers in the rectum aids in elevation of the prostatic portion of the urethra. Once the prostatic adenoma

has been removed and final examination reveals no other nodules, the prostatic fossa is packed with a small hot laparotomy sponge. This pack is left in the fossa for at least five minutes and discourages venous oozing. During this interval the anterior portion of the urethra is calibrated to assure that it will accept a No. 28 French instrument with ease. It is our routine practice to use a red rubber No. 26 French Foley catheter with a 30-cc. balloon, and, unless this catheter will pass with ease through the urethral meatus, we perform a meatotomy. The catheter is then passed to the prostatic portion of the urethra; the packing of the prostatic fossa is removed, and the catheter is drawn into the bladder. Examination of the prostatic fossa at this time, with the catheter in place, enables the surgeon to visualize any active bleeding. It has been our experience that most troublesome bleeding occurs in the areas of 5 and 7 o'clock at the vesical neck, and for this purpose figure-of-eight sutures of No. 00 plain catgut are employed, one on each side of the vesical neck. These sutures are carried deeply through the vesical mucosa and into the capsule of the prostate, but care is taken not to involve the ureteral orifices. It is not ordinarily our practice to remove a wedge of the vesical neck; if this orifice appears small after adenomectomy, however, such a wedge should be removed. All shreds and tags at the neck of the bladder are excised to produce a smooth orifice. Pieces of gelfoam sponge are then placed in the prostatic fossa; usually one is placed at each side, one posterior and one anterior to the catheter. If the cavity is large, other pieces of sponge are inserted as deemed necessary. The balloon of the catheter is then distended with at least 30 cc. of sterile solution, sometimes as much as 2 ounces being used altogether. The catheter is then pulled so that the balloon fits snugly against the vesical neck but is not drawn into the prostatic fossa itself, and this traction is maintained. By constant pressure of the balloon against the gelfoam-packed fossa, bleeding is well controlled. No obstruction of the catheter from the gelfoam has been observed in these cases. The bladder is then flushed with sterile saline solution to remove any debris and clots, and the closure of the bladder itself is begun. The first layer of the closure consists of an unlocked running suture of No. 00 plain catgut, which is placed through the mucosa, catching a small amount of the detrusor muscle itself. Careful approximation of the mucosa is highly important. Once this row of sutures is placed, a row of No. 00 chromic catgut is run, again without locking, above the mucosal layer, and this suture includes the serosa and deep muscularis of the bladder. When the suturing is completed, the bladder is distended with sterile saline solution to assure the surgeon that the closure is watertight. In the event that perforations still exist, further sutures are used to control any spillage. A large cigarette drain is left in the space of Retzius, and the fascia of the rectus abdominis is reapproximated with figure-of-eight sutures of No. 00 chromic catgut. The bladder is not elevated superiorly with these sutures but is allowed to remain in its anatomic position. The subcutaneous tissue is closed with No. 00 plain catgut, care being taken to include some of the deeper rectus fascia in order to eliminate potential dead space. The skin is closed with metallic skin clips, and the wound is dressed. Traction is maintained on the urethral catheter for approximately twenty-four hours after the operation by adhesive taping to the leg or by the use of a metal cage. We have encountered no postoperative incontinence in any of our cases, despite this prolonged traction. The

postoperative orders are not unusual except that penicillin and streptomycin are routinely given for five days after the operation, to reduce infection. Irrigations of the bladder are ordered as needed to prevent clot formation, and through the heavy red rubber catheter considerable suction can be exerted by a syringe; by this means any clots that are present are readily evacuated. It has not been our custom to employ postoperative coagulation within the prostatic fossa with a resectoscope, nor do we deem it necessary to resort to continuous irrigation of the bladder after the surgical procedure. Bleeding has been minimal in all of these cases; in fact, initially to our surprise, the bleeding has been less than that usually observed in the cases in which we have done transurethral resection. The urethral catheter is removed between the third and the eighth postoperative day, depending on the amount of blood in the urine, the appearance of the abdominal wound, and the general condition of the patient. Occasionally, after removal of the catheter and before spontaneous voiding occurs, a vesicocutaneous fistula may appear at the site of the drain. This is not serious, and it has been our practice to reinsert a No. 20 French Foley catheter into the bladder and leave it until the wound is again dry; this usually occurs within forty-eight to seventy-two hours. The clips are removed on the seventh postoperative day, and the patient is discharged after this.

SUMMARY

The authors advocate primary closure for suprapubic prostatectomy. There is nothing unusual or difficult about the operative procedure, and they have found that primary closure reduces the total hospitalization for the patient to within the duration of the hospital stay reported by advocates of Other Surgical Approaches. It is reemphasized that meticulous adherence to good surgical principles must be followed to permit successful closure. Crisscrossing of the incisions through the skin, muscle and bladder and water-tight double layer closure of the bladder are strongly recommended. Questioning has failed to reveal any decrease in the preoperative level of libido; on the contrary, frequently patients have been gratified by an increase in their sexual powers.

Primary closure of the bladder after suprapubic prostatectomy is described and the results obtained are discussed. Consecutive cases are reviewed in which no secondary surgical procedures have been required because of postoperative hemorrhage. When needed, concomitant diverticulectomy, segmental resection of the bladder or removal of calculi has been performed without hesitation or fear of breakdown of the primary closure.

ZUSAMMENFASSUNG

Die Verfasser empfehlen den primären Verschluss der Wunde bei der suprapubischen Prostataresektion. Sie sehen nichts Aussergewöhnliches oder Schwieriges in dem operativen Verfahren und haben gefunden, dass sich durch primären Wundverschluss der Krankenhausaufenthalt so weit verkürzen lässt, dass er dem von mit anderen chirurgischen Verfahren behandelten Kranken entspricht. Es wird von neuem hervorgehoben, dass sorgfältigste Beobachtung guter allgemeinchirurgischer Grundsätze die Voraussetzung für einen erfolgreichen Wundverschluss ist. Kreuzung der Schnitte durch die Haut, die Muskulatur und die Blase und ein wasserdichter Verschluss der Blase mit Nähten in zwei Lagen werden dringend empfohlen. Ein Absinken der Libido nach der Operation hat sich durch Befragung der Patienten nicht nachweisen lassen. Im Gegenteil, die Patienten erfreuen sich häufig

eines Anstiegs der Geschlechtskraft nach dem Eingriff.

Der primäre Verschluss der Blase nach suprapubischer Prostataresektion wird beschrieben, und die erzielten Erfolge werden erörtert. Eine Reihe unausgewählter Fälle wird besprochen, in denen ein zweiter Eingriff wegen postoperativer Blutungen nicht erforderlich war. Wenn die gleichzeitige Resektion eines Divertikels, die Resektion eines Blasensegments oder die Entfernung von Steinen nötig war, wurden diese Eingriffe ohne Zögern und ohne Furcht vor einem Zusammenbruch des primären Verschlusses ausgeführt.

RÉSUMÉ

Les auteurs préconisent la fermeture primaire de la prostatectomie sus-pubienne. Cette technique n'a rien d'inaccoutumé et ne présente aucune difficulté particulière; le temps d'hospitalisation n'est pas supérieur à celui nécessité par d'autres méthodes. Il est vivement recommandé de pratiquer des incisions en croix à travers la peau, les muscles et la vessie, avec fermeture double, étanche, de la vessie. L'interrogatoire des malades n'a révélé aucune diminution pré-opératoire de la libido, bien au contraire.

Les détails techniques et les résultats sont exposés. Les auteurs n'ont pas eu de cas d'hémorragie postopératoire. Lorsque c'était nécessaire ils n'ont pas hésité à pratiquer une diver culotomie, une résection partielle de la vessie, ou une ablation de calculs concomitants, sans avoir à craindre une rupture de la fermeture primaire.

RESUMEN

Los autores defienden el cierre primario en la prostatectomía suprapúbica. En el procedimiento no hay nada extraño o difícil, y con ello se acorta considerablemente el tiempo de hospitalización. Se llama especialmente la atención sobre la escrupulosidad en la ejecución de la sutura con la más completa unión y adherencia de los tejidos. Se recomienda especialemente la sutura bien impermeable de la vejiga y la sutura de incisiones de direcciones cruzadas en la vejiga, los músculos y la piel. No parece haberse demostrado disminución de la líbido en relación con el período preoperatorio; por el contrario la mayor parte de los enfermos ha observado un aumento de la potencia sexual.

Se describe el cierre de la vejiga tras de la prostatectomía suprapúbica y se discuten los resultados. No se han necesitado nuevas intervenciones a consecuencia de hemorragias postoperatorias. Cuando ha hecho falta se ha operado sin dudar y sin miedo a perjudicar la sutura primaria casos de diverticulotomía concomitante, resección segmentaria de la vejiga y extracción de cálculos.

SUMARIO

Os AA. defendem o fechamento primario depois da prostatectomia suprapúbica. Acham que não há dificuldade e pensam que o fechamento primario reduz o tempo da hospitalização ao mesmo tempo que os outros métodos cirurgicos.

Salientam que uma norma rígida da técnica cirurgica possibilita o fechamento eficiente. Recomendam com insistência que sejam praticadas as suturas sem coincidência de niveis da pele, músculo, bexiga executando-se tambem a sutura em du pla camada na bexiga. A investigação feita demonstra que não houve quéda da intensidade da libido que, pelo contrário, aumentou segundo a informação satisfato ria dos pacientes operados.

A sutura primaria da bexiga após a protatectomia suprapúbica é descrita pelos AA. que mencionam os resultados obtidos. Nos casos seguidos não houve necessidade de re-operar por causa de hemorragias pós-operatorias.

Um diverticulotomia concomitante, a resecção segmentaria da bexiga ou a remoção de calculos foi feita quando necessaria sem receio de prejudicar a sutura primaria.

RIASSUNTO

L'autore sostiene la necessità della chiusura per prima nella prostatectomia soprapubica. Non vi è alcuna controindicazione a questo prinipio, che ha il pregio di ridurre il periodo di ospedalizzazione dei pazienti in rapporto alla durata del ricovero che è necessario dopo altri tipi di intervento. Grande importanza viene attribuita ad una meticolosa tecnica operatoria se si voglia ottenere una chiusura della vescica senza inconvenienti, e sopratutto alla corretta incisione della cute, dei muscoli e della parete vescicale, seguita da una sutura in doppio strato a tenuta perfetta. Non si è avuta alcuna diminuzione della libido, spesso anzi i pazienti hanno notato un aumento della loro attività sessuale.

Viene descritta la tecnica operatoria e vengono comunicati i risultati a distanza; nessun malato dovette essere rioperato per emorragia. Se necessario, si può eseguire anche una resezione contemporanea di diverticoli o una resezione parziale di vescica o l'asportazione di calcoli.

The historic advances in neuroendocrine and biochemical research in psychiatry today demand a unifying concept. The exquisite recent work on the chemistry of and humoral changes in schizophrenia cannot and should not be permitted to stand in splendid isolation. The door between laboratory and clinic must never be closed and different laboratories must be connected by conceptual bridges. The varieties of clinical phenomena in schizophrenia make it unlikely that a simplistic approach to a single chemical or enzymatic disruption will solve the riddle of the so-called functional psychoses. New biochemical findings must be related to equally important neuroendocrine facts, such as the clearing of schizophrenia in the eunuch or in hypogonadal patients when testosterone is administered, or the improvement in psychologic functioning when hypothyroidal psychotic persons are treated with thyroid. It is our hope that those who have made such fine contributions in different sectors will dedicate some of their time to unifying concepts that will not only relate critical elements of the work on serotonin and norepinephrine to the findings on psychomimetic and psychotherapeutic agents but that will be broadened so as to encompass the great body of neuroendocrine and clinical data.

Marti-Ibanez

Uterus Didelphys with Hematocolpos and Hematometra on One Side and Normal Menses from the Other

Report of an Unusual Case

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THE rarity of the congenital anomaly known as uterus didelphys, associated with other congenital anomalies and yet with normal menstruation, prompts this report.

Congenital malformations of the reproductive organs in women are not rare. They are all interesting, potentially serious conditions that warrant careful consideration because of serious obstetric as well as surgical complications. The case to be presented here is unusual in that it involved a double uterus, a double vagina and a double cervix; one normal vaginal vault, and one vaginal vault remaining imperforate, so that, with menstruation from the right side of the uterus, the flow did not escape, and resulted in massive hematometra and hematocolpos, although the patient was apparently menstruating normally.

Embryologically, the malformations of the reproductive organs are due to incomplete union of the mullerian ducts. The uterus didelphys is caused by complete failure of fusion of the middle third of the ducts, resulting in a double uterus and a double cervix. If the intervening septum remains in the distal thirds, there is also a double vagina. Lack of complete fusion, and disappearance of the intervening septum at any point from below upward, or throughout the length of the tube ducts, explains most of the anomalies observed. The rudimentary development of one duct or the cervical canal of one side accounts for the remainder of the anomalies. Because of the close association of the mullerian ducts with the wolffian ducts, anomalies of the urinary tract are often observed in conjunction with anomalies of the female genital tract.

The embryonic causes of these malformations are varied and are all theoretical. Uterus didelphys is unusual, although not extremely rare. Complete duplication of the genital tract, with unilateral atresia and retention of menses, is exceedingly rare. Only a few cases can be found in the literature. Embree[1] in 1950 thoroughly reviewed the literature and found 4 cases of apparent uterus didelphys with unilateral hematometra, including a report of his own. Simon[2] in 1928 cited Quenu and LeSourd, who in 1926 reviewed 8 cases of uterus didelphys with hematometra. In further review of the literature, I find 3 more cases or like cases. Vernaglia,[3] Rowley[4] and Whitney[5] all reported individual cases

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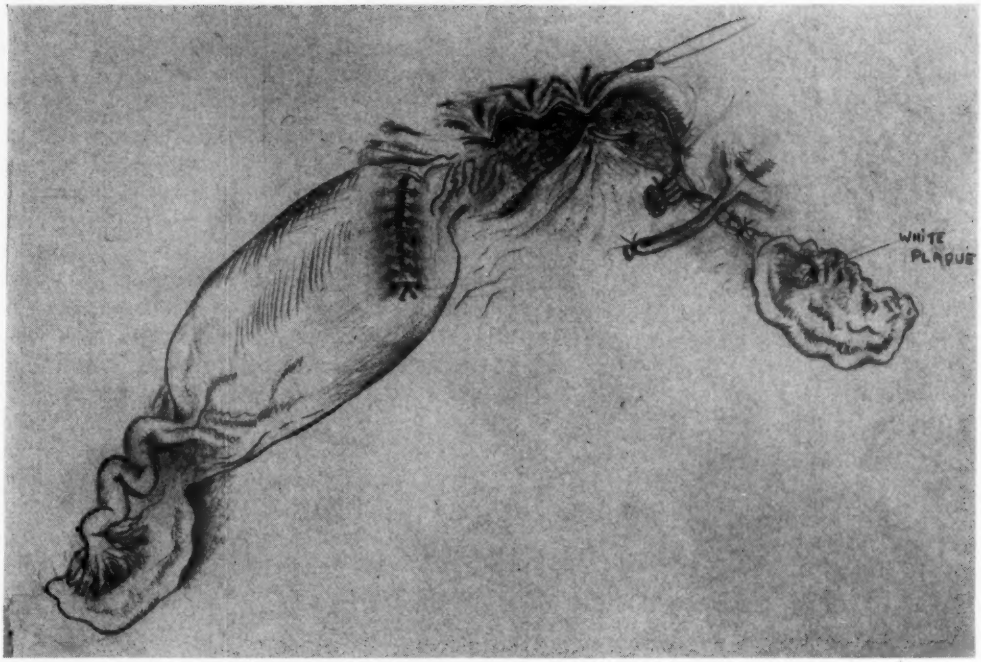

Fig. 1.—Artist's conception of appearance after removal of right uterine body.

in 1948. Jones and Jones[6] reported a case in 1953. These are all similar but not identical. Uterus didelphys with hematometra is a rare condition, but the latter anomaly with hematocolpos and normal menstruation is exceedingly rare, and possibly this is the only such case yet reported.

Because of the close association of the mullerian ducts and the wolffian ducts, there are frequently congenital anomalies in the urologic system as well. Eismayer stated that the left kidney is more frequently absent with double uterus.[3]

In the case to be reported, in addition to the abnormalities of the reproductive system, there was congenital absence of the right kidney and ureter.

Pathologic Picture.—A double uterus and cervix were observed, with a complete septum between them in the lower third.

The right vaginal vault incomplete and ending blindly, in the right labia, causing hematometra and hematocolpos on the right side.

Apparently normal left vagina and cervix.

Congenital absence of the right kidney and ureter.

Incidence.—Fenton[7] reported 0.004 to 3.8 per cent of congenital anomalies of the uterus and vaginal vault in all women. A review of all reported cases of uterus didelphys with unilateral hematometra reveals that it occurred on the right side in every instance.

Complications.—The following statistics are based upon women with congenital anomalies who became pregnant:

The incidence of abortion, including ectopic pregnancies, ranged from 24 to 53 per cent.

The proportion of patients who went to term was 65.1 per cent.

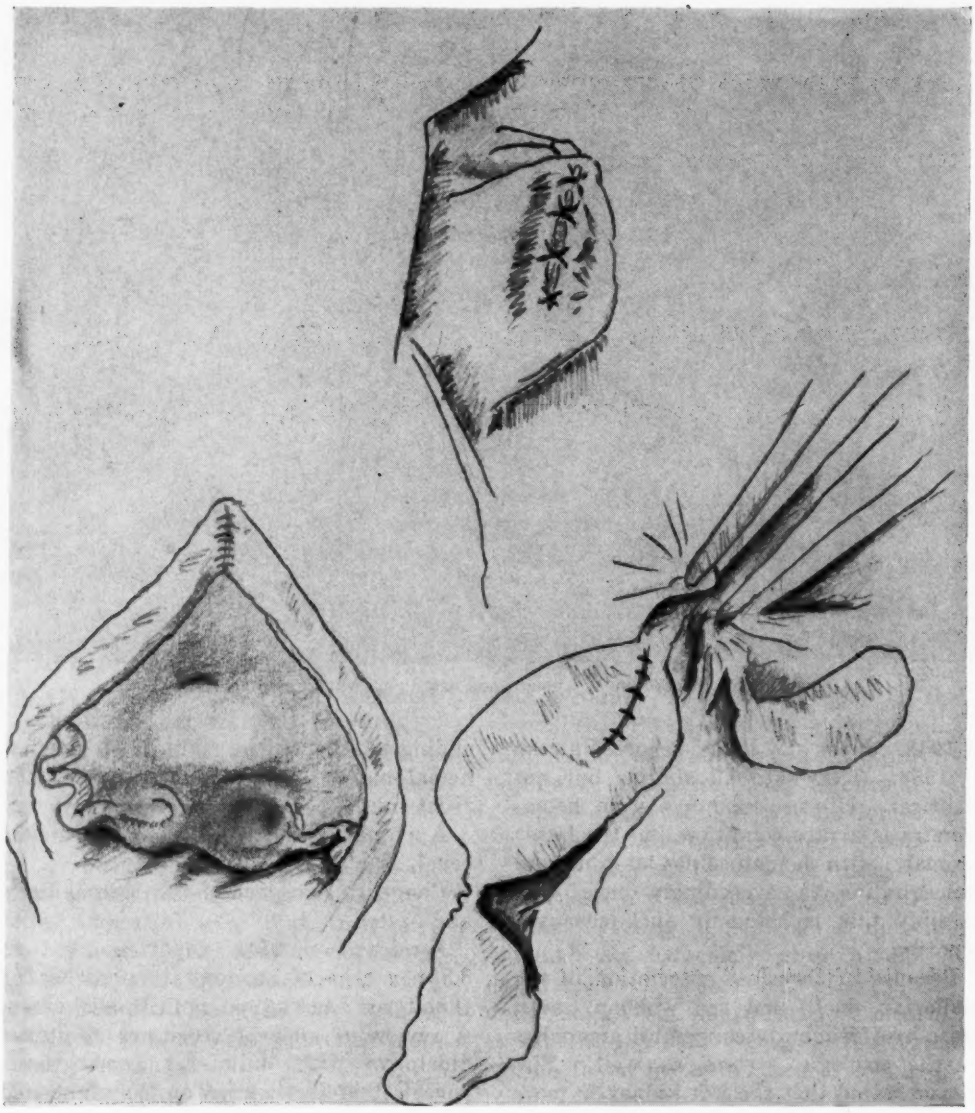

Fig. 2.—Artist's conception of pelvis before removal of right uterine body, but after drainage of right hematometra and hematocolpos.

In 17.1 per cent there was malposition of the fetus.

In 11.1 per cent toxemia was encountered.

In 1.25 per cent there were plural pregnancies; in 7 per cent, a retained placenta.

In 25 per cent cesarean section was performed for various reasons.

In 1.9 per cent maternal deaths were reported.

In 8.5 per cent fetal deaths occurred.

Complications Without Pregnancy. — Complications observed in nonpregnant women were as follows: (1) hematometra; (2) hematocolpos; (3) hematosalpinx; (4) endometriosis, and (5) rupture of an abnormal uterine horn.

Treatment of Choice.—Surgical measures based solely on the presence of an anomaly is not justified, according to Jarcho.[8] The rarity of some deformities and the great variety of deformities make each case a problem in itself, and no set treatment can be formulated. The less the deformity, the less the danger. If possible, one would like to remove the septum separating the two uterine bodies, but with the double uterus in this case, with only the lower portion of the uterine cavities separated by a septum, and a double cervix as well as a double vagina, it was difficult to accept this treatment of choice. The choice lay between removal of the septum between the two vaginas, and the procedure actually performed—removal of the right uterus, cervix and right blind vaginal vault. I was convinced that removing the vaginal septum only increased the risk of a pathologic pregnancy in the right uterus. It is also well known that perforation of the septum between the two uterine bodies frequently and most commonly is not permanent; the artificial septal perforation heals and the hematometra recurs, as occurred in this case.

REPORT OF A CASE

A 12-year-old white girl first started to menstruate on March 30, 1955. She complained of occasional pain in the right hip and buttock. Her mother did not relate this to menstrual periods, and not too much was thought of it.

On October 8 a physician was called to see the patient because of severe pain in the right buttock and in the back. Physical examination gave essentially negative results, except that the child complained of a stiff back and stated that it hurt to "bend over." A spinal puncture was done, and this revealed no abnormality. The menses started on October 11, and the pain gradually disappeared, although the hip ached. It was difficult for the patient to participate in active sports, but she did participate nevertheless.

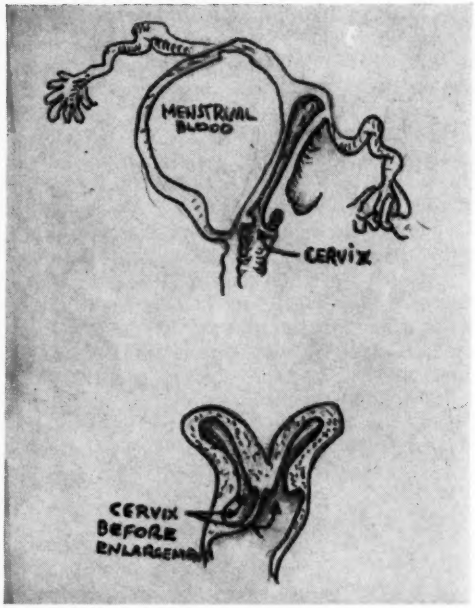

Fig. 3.—Artist's schematic conception of pelvis before removal of right uterine body and before drainage of the right hematometra and hematocolpos.

On December 12 the pain started again, and the patient had difficulty in urinating. The menses started on December 13. On Jan. 19, 1956, a physician was called because of the patient's difficulty in urinating. In order to void urine, it was necessary for her to sit in a tub of warm water. This time she had had pain since January 12. For two days the temperature was above 100 F., and the throat was sore. Menstruation started on January 18. Physical examination on January 19 gave negative results, except that there was tenderness in the lower central abdominal area. A mass about the size of a large orange could be palpated. Rectal examination revealed a large mass in the pelvis. On examination of the pelvis with a small speculum, a bulging mass could be seen, protruding downward, in the right side of the vaginal vault. The lower part of the abdomen was extremely tender to

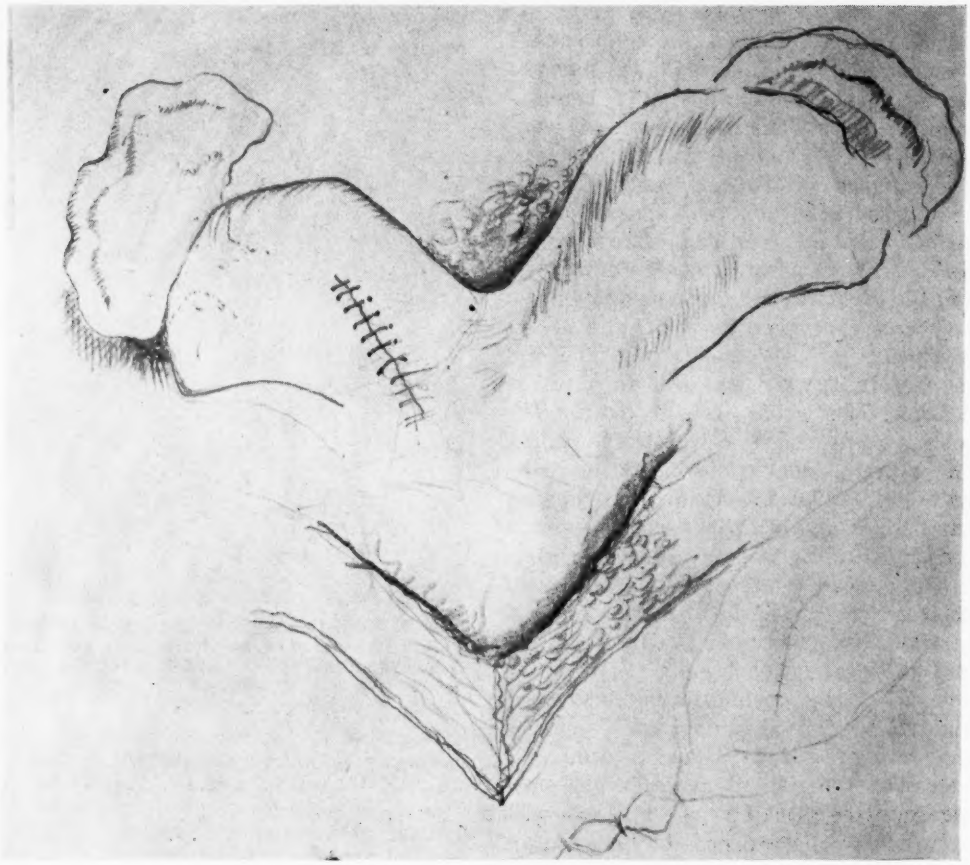

Fig. 4.—Artist's conception of the pathologic condition before removal of right uterine body.

palpation. The patient complained bitterly of discomfort in the right hip.

Laboratory tests revealed a white blood cell count of 15,000 per cubic millimeter. The value for hemoglobin was 14.7 Gm., or 104 per cent. The sedimentation rate was 17 in forty-five minutes.

Catheterization was performed, and the patient was relieved of much of her distress.

Operation was performed on January 20. A low midline incision was made. The abdomen was opened. A cystic mass the size of a large grapefruit filled the entire lower part of the pelvis, particularly on the right. This was punctured with a trocar and drained by suction.

A vaginal examination was performed, a probe being passed into the left cornu of what appeared to be the entire uterus. A probe was then used to puncture the septum into the hematometra in the right cystic cornu, and a catheter was pulled down through. The puncture wound in the right uterus was closed with a purse string suture.

The abdomen was explored and a uterus didelphys was observed, with a blind vaginal vault extending down beside the normal vaginal vault on the right side. The wound was closed. The patient recovered uneventfully. The catheter was removed in seven days.

On January 31 an intravenous pyelogram was taken, revealing excellent function on the left side but no function on the right.

Oil insufflation of the uterus was performed

on February 7. Under pressure, oil spilled readily through the left salpinx, and no oil spilled into or filled the right uterine body. No oil could be forced into the right uterine body. Cystoscopic examination was performed at this time. There was no evidence of a ureteral orifice on the right or of a right ureteral ridge.

There was no spotting or bleeding, and the next menstrual period was relatively comfortable. The pain in the hip had disappeared, and the patient felt well.

Because the opening in the intervening septum between the two uterine bodies had not stayed patent (as evidenced by the oil hysterogram), it was decided that the right uterine body should be removed.

On February 10, a second operation was performed. The abdomen was opened; on exploration, no right kidney or ureter was present. The right cornu of the uterus was opened and the large cavity explored. This had shrunk considerably since the first operation, when there was massive hematometra. It extended well below the normal cervix that could be felt and seen in the vagina, and there was a blind cavity parallel to the normal vagina.

The cavity was dissected free and inverted, an attempt being made toward complete removal of the vaginal mucosa of this blind vaginal tract. The right uterine body was freed by sharp dissection from the left uterine body without entrance into the cavity of the left, or normal, uterus. The entire right uterine body, its cervix and its abnormal vaginal vault were removed. The muscularis coat of the remaining uterine body, where it had been attached to the right body, was closed with a mattress suture so that the edges were approximated. The entire pelvic region on the right side was peritonealized. The right tube was removed, together with the right uterine body, and the right ovary was left intact. The round ligament on the right was severed before removal of the uterine body. The uterine arteries were clamped, cut and ligated individually. The tract remaining after removal of the right cervical body and the blind vaginal tract, was perforated through into the normal vaginal tract, and a drain was placed into this region. A biopsy specimen of the right ovary was taken. The abdominal wound was then closed in layers.

The pathologic report identifies the tissue as uterus with endometrium in an active proliferative phase; fibromuscular tissue identified as vaginal mucosa, and cervical tissue. There was a normal fallopian tube. Biopsy of the ovarian specimen revealed no pathologic change.

The patient made an uneventful recovery and since that time has had normal menstrual periods. She no longer has pain in the hip or buttock. For approximately four months there was a slight vaginal discharge, but it was not bloody. This ceased completely after approximately five months.

The patient had no difficulties whatever until one month prior to the time of writing, when spotting began between periods. Vaginal examination revealed acute hemorrhagic vaginitis, nonspecific infection; otherwise the results were negative. There was no evidence of a mucocele in the region of the right vaginal vault.

SUMMARY

1. The subject of uterine anomalies and their incidence is reviewed briefly.

2. The rarity of like congenital anomalies is pointed out.

3. A case is reported which, so far as the author is aware, is the first reported case of a double uterus, double cervix, double vagina and congenital absence of the right kidney, with the right vaginal vault ending blindly in the right labia, producing unilateral hematometra and hematocolpos in a normally menstruating young woman.

Author's Note: Cordial thanks and appreciation are expressed to Mr. Reino Randall, Professor of Art at Central Washington College, Ellensburg, for the surgical sketches accompanying this article.

SUMARIO

Faz uma breve revisão do problema das anomalias uterinas acentuan do a raridade. Cita um caso que considera único da existência de utero duplo, duplo colo, dupla vagina e ausência congenita de rim direito com terminação direta no grande labio direito produzindo hematometrio unilateral e hematocolpos em uma jovem normalmente menstruada.

ZUSAMMENFASSUNG

1. Anomalien der Gebärmutter und die Häufigkeit ihres Vorkommens werden kurz besprochen.

2. Auf die Seltenheit solcher angeborenen Abweichungen vom Normalen wird hingewiesen.

3. Es wird über einen Fall berichtet, der, soweit dem Verfasser bekannt ist, der erste dieser Art ist, der zur Veröffentlichung gelangt. Es handelt sich um eine normal menstruierende junge Frau mit doppelter Gebärmutter, doppeltem Kollum, doppelter Scheide und angeborenem Fehlen der rechten Niere. Das rechte Scheidengewölbe endet blind in die rechte Schamlippe und führt zu einseitiger Hämatometra und einseitigem Hämatokolpos.

RESUMEN

1. Se hace una breve revisión de la naturaleza y frecuencia de las anomalías uterinas.

2. Se señala la rareza de las anomalías congénitas.

3. Se presenta un caso, el primero de que tiene conocimiento el autor, de doble útero, con doble cuello y doble vagina, con ausencia del riñón derecho, en el que la bóveda vaginal derecha termina ciegamente en el labio derecho produciendo hematometra y hematocolpos en una mujer joven con menstruación normal.

RÉSUMÉ

1. La question des anomalies de l'utérus est brièvement exposée.

2. La rareté de certaines anomalies congénitales est signalée.

3. L'auteur rapporte un cas qu'il pense être le premier du genre dans la littérature, présentant: un double utérus, un double col, un double vagin, avec absence congénitale du vagin droit, la paroi supérieure du vagin aboutissant à la grande lèvre droite et produisant une hématométrie et une hématocolpose unilatérales. Il s'agit d'une jeune femme à menstruations normales.

RIASSUNTO

1. Vengono brevemente elencate le anomalie dell'utero e la loro frequenza.

2. Ne viene messa in evidenza la rarità.

3. Viene riferito un caso, che probabilmente è il primo descritto nella letteratura, di utero doppio, con doppia cervice, doppia vagina e assenza congenita del rene destro, in cui la vagina di destra terminava a fondo cieco nel labbro di destra producendo un'ematometra unilaterale e un ematocolpo. La giovane donna aveva normali mestruazioni.

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Ophthalmologic Surgery

Operation for Cataract as an Office Procedure

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HONGKONG

IT began out of necessity when I first tried cataract extraction in my office a few years ago. Such occasions were far apart, as many a time I had chosen to refuse a case rather than to submit my patient to a procedure which heretofore all my teachings took for granted as an unjustified risk. But the problem repeatedly came up. What can be done with this patient, blind with cataracts, who can neither afford the expense of a private hospital nor wait on the long list for a charity bed? This problem is perhaps regional, but each region must find its own solution.

Hongkong has no eye hospital. There is a medical school, but it has no eye department. The general hospitals, whether government-owned or privately owned, will admit patients for ocular operations, but their facilities in the operating room and in the ward are prepared for general surgery only. Their personnel and nursing service are not specially trained for the care of patients. It is necessary for the ophthalmic surgeon not only to bring his own instruments but to take them out, sterilize them, lay them out on the table, and put them away himself; or he will find that the operating-room nurse, with the best of intentions and the quickest of hands, has already thrown his cataract-knife, deWecker scissors, trephines, etc., together with a whole bunch of other instruments, into the boiling sterilizer. He will be wise to bring his own assistant to the operating table and to do all the post-operative dressings himself. Facing such inconvenience, the ophthalmologist is not particularly keen to make use of any hospital in town.

The economic problem is sometimes an insurmountable obstacle. To go to any private hospital will take at least half of a wage-earner's monthly income. Few free beds are allotted to patients with ocular disease in the government or charity hospitals, and the waiting lists are long. These are the reasons that make me ask myself whether it is not possible to omit hospitalization in cases of cataract. If so, what risks are there to be reckoned with, and is one justified in taking these risks or not? The answers to these questions are revealed after the completion of 70 consecutive operations in my office.

Selection of Patients.—I selected my cases very cautiously and slowly at the beginning, waiting for the patients themselves to insist on my doing the operation in the office. I rejected many as unsuitable for the office procedure—those who were obese; those who had diabetes not controlled by insulin; children who would not voluntarily lie on the operating table and, finally, those who lived too far away. Near the end of the experiment I purposely selected difficult cases to see what would actually happen. Among those chosen were some with severe trachoma with a complete assortment of complications; some with a

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metallic foreign body in the vitreous; some with glaucoma absolutum, and some in the end stage of Vogt-Koyanagi disease. Some of these were known to be in hopeless condition, but the lens extraction was done for the purpose of the test.

How far from my office a patient lived and what sort of living space he had was considered an important criterion in selecting patients for office operation. Transportation from the operating table in my office to the patient's own bed at home was thought to be entirely decisive as to whether the treatment would turn out successful or not. To my surprise, the results of the 70 cases did not justify my original anxiety, nor did they substantiate the importance I had put on transportation. I made it a rule that a patient must have someone to accompany him, must go home in a taxi, and for the subsequent three or four visits must come and go also in a taxi. The case was discarded if the patient would not promise this. I found out later that the rule could not be strictly enforced. Even though a patient could arrange for a taxi, there was still much walking to do when he got off the operating table. He had to walk fifty steps to the door of the lift. If the lift was not working, he walked down three stories to the street. Usually he had to climb three or four flights of stairs to his apartment, even if the taxi could bring him to his own doorstep.

This is the minimum of travel on foot for every patient operated on. One old fisherman (No. 32) gave his address as an unnumbered hut at the end of the island. It turned out to be a cave up in the hills, which he must do a great deal of climbing to reach. On his first postoperative visit he told me that he could not afford the five-mile taxi fare, and that he had to come this time on the tram—more than an hour of riding in a crowd. Furthermore, his friend told me that on the day of the operation they did not have taxi fare between them, so they walked home together, the entire five miles. Since they had been told not to take the bus or the tram, their only alternative was to go on foot, and it was past midnight before they reached home. The patient showed up for dressings three times afterward, and after the last time, when the sutures were removed, he never turned up again. Nothing unusual ever did happen to the eye, and the vision, roughly taken with a plus 8 sphere on that last day was 6/30.

One diabetic woman (No. 12) also walked home direct from the operating table, because she said there was no point in taking a taxi just to go across the street. Her room was on the fourth floor above a stationery store, truly a crow's flight, though only about 150 yards from my office. The walk consisted of two crossings against heavy motor traffic in charge of two policemen—comparable to two crossings in downtown New York. Because of the nearness, I went four times myself to do the dressing and administer insulin. The wooden staircase was 2 feet wide, up an angle of 60 degrees and straight, without turning at each floor. One day the family pulled me aside to ask if I could please persuade the old lady not to go downstairs every day to look after the cash register in the shop, which she had been doing since the second day after the operation. I replied that it was now quite all right, and from the next time on she could also walk to the office for the dressing. The entire postoperative course was smooth and uneventful.

There is a wide difference in the variety of dwellings the patients call home. Though a few have luxurious and comfortable houses, the majority live in tenement buildings several stories high, in rooms with tiers of beds housing ten to fourteen persons per room. There are

no facilities, and there is no privacy to speak of for these people.

What the patients actually do during the two weeks of convalescence I have not yet fully found out. In the first place, none of them has taken the operation too seriously. They were not ill, they had no pain, they walked right after getting off the operating table, and they walked to have the eyes dressed. So they asked why they could not walk to the teahouse just around the block, or why they should not have a game of cards with the neighbors. I suspect that they take many more liberties with themselves and their conditions than my simple instructions allow.

Preoperative Preparation. — All preoperative investigations are completed on the first day the patient is seen—blood pressure, Kahn test and routine urinalysis, as well as the filling out of the complete eye record. If a patient is not acutely ill, has no fever, cold or cough and can walk on his own, he is accepted. A brief explanation of the plan and procedure is given the patient and his family. This is an important part of the preparation, i.e., to win the patient's and the family's confidence from the beginning. A date is arranged, and a dropper bottle of 0.25 per cent chloramphenicol is given the patient, to be used every two hours in both eyes up to the day of operation. Ordinarily there is no other medication. I have used bromides, vitamins, diamox, hormones, rutin, etc., and found them all valuable when indicated, but unessential as a routine. Trachoma, in any stage, is usually no contraindication. Syphilis revealed by a blood test is treated after the operation; it is not mentioned preoperatively. It is not necessary to treat it at all as far as the cataract is concerned. Diabetic patients are given a diet and treatment until they are well under control for a long period.

Sedatives.—Amylobarbitone, 1 gr. is sometimes given the patient before the operation, while he is waiting in the sitting room. Preoperative sedation is not necessary in most of my cases. The patients can lie down to take it with an equanimity that no synthetic sedative can ever produce. Ignorance may sometimes cause the patient to refuse the knife, but nervousness on the operating table is not characteristic of the phlegmatic Chinese patient.

Asepsis.—The usual aseptic routine is observed without conscious effort by everyone in my office. In comparison with that of the operating theatre of a hospital it has been simplified to the minimum requirement. My sterilizer is a Montgomery Ward pressure cooker. There are two sterile towels for the patient and one for the instrument table. Immersion in 75 per cent ethyl alcohol sterilizes all sharp instruments. Cotton swabs, silk sutures and blunt instruments are boiled together in one pan. Bichloride of mercury solution is used for the hands, with a brush and ordinary soap. No gloves and no gown are provided. There has never been an infection.

Operation.—The procedure follows the usual accepted methods. I did the operation myself in all 70 cases, so the technic is uniform and the results are comparable. I use 1 drop of 1 per cent atropine to dilate the pupil when the patient comes to the waiting room and 1 drop of 10 per cent phenylephedrine before scrub-up. The patient is given, in both eyes, 6 drops of 0.2 per cent nupercaine within half an hour, which is sufficient to enable me to start operating even without other anesthetics. A 10 c.c. syringe is filled with 2 per cent procaine-epinephrine, and the same 25-guage, 1½ inch needle is used throughout.

A drop is injected into the subconjunctival space, 1.5 c.c. deep into Tenon's capsule but not into the muscle cone, 8 c.c.

by van Lint's facial nerve block, and also into the circumorbital tissue. No retrobulbar hemorrhage occurred in any of these office cases, as compared to an 8 per cent incidence in the hospital when an injection into the muscle cone is made with a 2-inch 5 c.c. needle. Hypotony is usually sufficient; if not, massaging the eyeball with the fingers for two or three minutes will bring the tension down to the desired level.

Canthotomy is done when deemed necessary. The Park retractor is put in position. A riding suture is placed underneath the superior rectus. A limbal-based conjunctival flap about 2mm. wide is made with scissors around the cornea from 9 to 3 o'clock. Two fine silk sutures, conjunctiva-sclera-conjunctiva, are preplaced. One conjunctiva suture at 12 o'clock is held long with a clamp to be used for lifting the cornea flap later. Incision of the cornea by keratome and scissors is made from 8:30 to 3:30. A small peripheral iridotomy is done, or, if the pupil is rigid, the iris is cut radially through. Whether to do an intracapsular or extracapsular extraction is decided upon at this stage (usually not before), when the lens is exposed to full direct view by pulling open the corneal flap. If the situation allows, I prefer the intracapsular method. The lens capsule is tested with the Arruga forceps to see whether it is thick or thin and whether the zonules will "give" readily or not. These are the two deciding factors. If the capsule is too friable or the zonules too tough, I abandon the intracapsular plan in favor of the safer extracapsular procedure. Forcing the tough zonules will increase the possibility of loss of vitreous, and breaking the friable capsule after some manipulation in an intracapsular attempt is not the same as intentionally breaking it with a quick clean bite at the beginning. In my 70 consecutive office cases I have not encountered one case of loss of vitreous. In 2 or 3 cases I had to disturb the vitreous by cutting into it or dipping the magnet tip into it, but there was no loss. In comparison, 10 to 15 per cent of vitreous loss occurred in my hospital cases, in 90 per cent of which the intracapsular method, was used. Of the office operations only 50 per cent are done by the intracapsular method, after assurance obtained by testing the capsule that the whole lens will come out easily. In the hospital cases the intracapsular method is decided upon in advance and is usually carried through regardless of last-minute difficulties. In the office I become more cautious and do the extracapsular extraction when there is any question of safety.

After closure of the wound with 8 or 10 silk sutures, cortisone and an antibiotic are put in and a moist pad applied. Moistening makes the pad conform to the lids and serve as a splint when dried. An aluminum shield is used until the first dressing. The patient remains quietly on the table from half an hour to an hour, gradually raising the body to a sitting position before he is allowed to get up and walk out. He takes the elevator three flights down and hails a taxi at the door. He takes home a few aspirin tablets in case there is any pain. The untreated eye is usually left uncovered to allow him to see, but if this happens to be a blind eye I cover it also with a pad. I observe that a blind eye has a tendency to roll around aimlessly, whereas a patient with one seeing eye tends to turn his whole head, rather than just the eyeball, in order to see an object. Monocular or binocular bandaging, however, does not seem to make any difference in the issue. The patient is instructed to walk as naturally as possible except that he must hold up his chin at all times; this tends to slow down his gait. He is to put his hand on

the shoulder of his companion, who is supposed to be guiding, not carrying, him home.

Other instructions to the postoperative patient are simple. Stay at home; leave the eye coverings alone; lie down or sit naturally in a chair; refrain from taking a bath or using a toothbrush for one week; do not restrict your diet; have regular bowel movements, and sit straight at stools. Tobacco smoking and alcoholic drinks do not seem to influence the postoperative course one way or the other. The patients usually volunteer the information, or rather ask the question, as to their consumption of these items. My ready advice is to cut down a little on the habitual daily quantity. Entire abstinence is not necessary.

Postoperative Care.—The first postoperative visit takes place on the third or fourth day after operation. The eye is usually quiet and shows minimal reaction. There are a few corneal striae. There usually has been no pain requiring aspirin. Hyphema, ranging from a small fluid level below the pupil to the filling of the entire A.C., occurs after the second or third visit, or around the sixth or eighth postoperative day. In 11 cases hyphema occurred. This is about the same incidence as applies to my hospital cases, in which postoperative hyphema occurred in 15 to 20 per cent. All were absorbed spontaneously in about one week, without further complication. The cause, in my opinion, is some minor trauma, although many patients cannot recall any accident at all.

The toilette of the eye consists of wiping the lids clean and putting in a drop of cortisone-chloramphenicol before covering the eye again with a sterile pad. The sutures are removed after the tenth day. They usually hold well for three visits; after that they begin to drop out one by one. Glasses, if needed, are given after two months.

Results.—The accompanying table presents the results in this series of cases. There has been no complication during the operating procedure, and no untoward incidents along the journey home have occurred in any of the 70 cases. During the postoperative course the eyes showed no unusual phenomena in the process of recovery as a result of allowing the patient to go home immediately. The distance traveled, in some cases quite long and rugged, did not produce any noticeable effect on the postoperative course. Likewise, there seemed no difference in outcome when I compared my carefully hospitalized cases to these cases of domicilary care. The results in visual acuity compare favorably with those obtained in patients treated anywhere or by any method. Some quickly obtained early perfect vision. Some did not show up for glasses, but the last checking showed good vision, with further improvement expected in due course. A few showed no improvement because of other underlying pathologic conditions, observable or not observable. The visual results, as a whole, were not influenced in any way by the fact that the operation was an office procedure.

As to the patients themselves, they appreciate the fact that it saves them a good deal of expense. They take the operation more lightly, and the actual procedure does not seem to them such a serious affair as before. In fact, they have all taken it too lightly and, against my precautions, have given themselves much more liberty than I should have dared permit at the beginning. They all say they prefer home to the hospital because they did not miss their s o c i a l contacts, although many a patient had no home to speak of. Only the very destitute, without any home at all, would have chosen hospitalization in the charity ward.

Summary of 70 Cataract Operations Performed in the Office

Operation No.	Age & Sex Of Patient	Preoperative Condition	Date of Operation	Operation	Eye Operated On	Preoperative Vision	Postoperative Vision	Postoperative Complications	Comment
1	33 M	OD: Complicated cataract; total opacity OS: Normal	8/10/54	Extra-capsular	OD	OD: Accurate light projection OS: 6/6, J 1	OD: 6/5		
2	43 M	OD: Normal OS: Cortical opacity	8/21/54	Extra-capsular	OS	OD: 6/5, J 1 OS: CF 1 M.	..... OS: 6/5, J 1	Thin hyphema 6th day	Trachoma II $\frac{\{++\|++\}}{\{++\|++\}}$
3	73 M	OU: Senile nuclear type OD > OS	9/16/54	Intra-capsular	OD	OD: CF 1 M., no J OS: CF 3 M., J 7	OD: 6/6-, J 3		
4 (7)	14 M	OU: Congenital lamellar	16/9/54	Discis-sion	OD	OD: CF 1 M., no J. OS: 6/60, no J	OD: 6/10, J 3		Complete absorp-tion, 2 mo.
5	37 F	OD: Normal OS: Complicated; complete opacity	11/4/54	Extra-capsular	OS	OD: 6/6, J 2 OS: Accurate light projection	..... OS: CF, 3M., J 5		Trachoma III $\frac{\{++\|++\}}{\{\ \ +\|+\ \ \}}$ 1/8/55, OS nee-dling OS fundus normal
6 (61)	50 F	OD: Postcapsular opacity OS: Postcapsular sector opacity	11/17/54	Extra-capsular	OS	OD: 6/60, J 6 OS: CF 1 M.	..... OS: 6/5, J 1		
7 (4)	14 M	OD: Surgical aphakia OS: Congenital lamellar	12/23/54	Discis-sion	OS	OD: 6/10, J 3 OS: 6/60, no J	..... OS: 6/10, J 3		Complete absorp-tion 1½ mo.
8	61 F	OD: Senile total OS: Few sectors opacity	1/10/55	Extra-capsular	OD	OD: Accurate light projection OS: 6/15, J 5	OD: 6/50	Probably low grade irido-cyclitis; pupil sealed after 1 yr. absence	4/5/55, OD nee-dling and wide opening; fundus normal
9	59 M	OD: Senile total OS: Normal	3/28/55	Extra-capsular	OD	OD: Accurate light projection OS: 6/15, J 7	OD: 6/30		Failed to show up after sutures removed

10	50 F	OD: Total white "bag o' milk" OS: Surgical aphakia 2 yr. ago in hospital	5/4/55	Extra-capsular	OD	OD: Light perception only OS: 6/10, J 2	OD: 6/10, J 2		OD: office operation; OS, hospital operation; results equal
11	69 F	OD: Complicated, total opacity OS: Normal eye	5/27/55	Extra-capsular	OD	OD: Doubtful light projection OS: 6/20, J 3	OD: 6/10, J 2		
12	74 F	OD: Total opacity; exotropia 150° OS: Sector opacity	7/21/55	Extra-capsular	OD	OD: Accurate light projection OS: 6/30, J 6	OD: 6/50	Secondary glaucoma 2 mo. after operation; went to absolutum	See Note 1.
13	68 M	OD: Complicated; total opacity OS: Normal	7/23/55	Extra-capsular	OD	OD: Faulty light projection OS: 6/10, J 1	OD: Faulty light projection		Trachoma III $\frac{\{++\mid++\}}{\{\ +\mid+\ \}}$ OD fundus normal; poor vision, cause undetermined
14	10 F	OD: traumatic; stuck by sewing needle; thick yellow plaque in front of pupil area OS: Normal	7/25/55	Incision 8:30-3:30; scissors removal of triangular piece of iris, membrane & lens	OD	OD: Accurate light projection OS: 6/5	OD: 6/6		Good, quiet little patient Trachoma III
15 (26)	55 M	OU: Complicated; brown nucleus; high myopia	8/18/55	Intra-capsular	OD	OD: Accurate light projection OS: CF 30.5 cm.	OD: 6/6-, J 2		Trachoma IV $\frac{\{++\mid++\}}{\{\ +\mid+\ \}}$
16 (24)	61 F	OU: Complicated; nuclear opacity	8/30/55	Intra-capsular with broad iridectomy above	OD	OD: CF 1 M. OS: CF 2.5 M.	OD: CF 2.5 M.		Trachoma IV $\frac{\{+++\mid+++\}}{\{+++\mid+++\}}$ See Note 2
17 (27)	29 F	OU: Complicated; nuclear opacity	9/5/55	Extra-capsular	OS	OD: CF 1 M., no J OS: CF .05 M., no J	OS: 6/5, J 1	Small hyphema	OS needling 9/4/55
18 (21)	3 F	OU: Congenital; ante & post-capsular white opacity	9/7/55	Discission	OD	No cooperation	No cooperation		OD: Fluid lens; dark pupil obtained next day; patient well-behaved on table

Summary of 70 Cataract Operations Performed in Office—continued

Operation No.	Age & Sex Of Patient	Preoperative Condition	Date of Operation	Operation	Eye Operated On	Preoperative Vision	Postoperative Vision	Postoperative Complications	Comment
19	60 F	OD: Staphyloma OS: Total nuclear opacity	9/8/55	Extra-capsular	OS	OD: Nil OS: CF 1 M., J 6	OS: CF 2M.		Trachoma IV $\left\{\begin{matrix} + + \mid + + \\ + \mid + \end{matrix}\right\}$ OS needling 12/20/55; OS fundus showed macular degeneration
20	60 F	OD: Total opacity OS: Normal	9/9/55	Extra-capsular	OD	OD: Accurate light projection OS: 6/7.5, J 1	OD: 6/7.5, J 3	Total hyphema on 6th day	
21 (18)	3 F	OD: Surgical aphakia OS: Congenital	9/9/55	Discis-sion	OS	No cooperation	No cooperation		OS: Fluid lens; dark pupil obtained immediately; good patient; Rx + 10.00 OU
22	58 M	OD: Senile nuclear OS: Surgical aphakia	9/13/55	Intra-capsular	OD	OD: CF 2 M., no J OS: 6/10, J 3	OD: 6/6, J 3		
23	78 F	OD: Atrophia bulbi OS: Hypermature cataracta nigra	9/22/55	Extra-capsular	OS	OD: Nil OS: CF 61 cm., no J	OS: 6/30, J 4	Vomited several times after returning home from operation. Nothing happened to OS	OS: Thin post-capsular membrane; may require needling later
24 (16)	61 F	OD: Surgical aphakia OS: Complicated	9/24/55	Intra-capsular with broad iridectomy below	OS	OD: CF 2.5 M., J 7 OS: CF 1.5 M., no J	OS 6/60, J 6		See Note 2
25 (36)	58 M	OU: Total opacity OS > OD	10/3/55	Intra-capsular	OS	OD: CF 2 M., J 6 OS: CF .05 M., no J	OS 6/6, J 4	Small hyphema 8th day	Large nasal polypi resected 2 wk. prior to operation on eye

26 (15)	55 M	OD: Surgical aphakia OS: Total nuclear	10/4/55	Intra-capsular	OS	OD: 6/6-, J 2 OS: CF 30.5 cm.	OS: 6/15, J 3		Trachoma IV OS: C. maculae (trachoma)
27 (17)	29 F	OD: Complicated OS: Surgical aphakia	10/6/55	Extra-capsular	OD	OD: CF 1 M., no J OS: 6/10, J 2	OD: 6/5, J 1 OS: 6/5, J 1		OD needling 4/5/55
28	69 F	OD: Aphakia; phakoerisis done in hospital by me ½ yr. earlier. OS: Hypermature brown nucleus	10/15/55	Intra-capsular	OS	OD: 6/15, J 4 OS: Accurate light projection	OS: 6/15, J 3	OS: Full hyphema on 6th day, "after being in toilet half hour"	Kahn reaction "doubtful: moderate arteriosclerosis of retinal vessels"
29	68 M	OD: Total opacity OS: Early incipient	10/18/55	Intra-capsular	OD	OD: Accurate light projection OS: 6/15, J 4	OD: 6/5, J 1	Small hyphema on 7th day	
30	69 M	OD: Normal OS: Complicated & hypermature	10/20/55	Extra-capsular	OS	OD: 6/10, J 1 OS: CF 1 M.	OS: 6/12, J 4		OS: Friable capsule; diabetes 20 yr., controlled by 2 OU insulin lente daily
31	55 F	OD: Late incipient OS: Sector opacity	10/21/55	Intra-capsular	OD	OD: CF 1.5 M. OS: 6/10, J 1	OD: 6/6-	Hyphema & vitreous hemorrhage on 7th day "8 children jumping on my bed"	Trachoma III OD: Fundus cleared up after 1 mo.
32	62 M	OU: Postcapsular opacity; nucleus clear	10/22/55	Intra-capsular	OD	OD: CF, 30.5 cm. OS: CF 61 cm.	OD: 6/30		Kahn reaction 2 plus the "cave dweller"
33 (40)	63 F	OU: Senile late incipient	10/25/55	Intra-capsular	OD	OD: CF 1 M., J 2 OS: CF 3 M., J 2	OD: 6/6-, J 2		Trachoma III active
34 (39)	62 F	OD: Mature OS: Hypermature	10/29/55	Extra-capsular	OS	OD: CF close OS: Accurate light projection	OS: 6/10, J 2		OS: Friable capsule
35	12 M	OD: Normal OS: Traumatic total opacity by blunt force	10/30/55	Discission	OS	D: 6/5 OS: CF 30.5 cm.	OS: 6/6-, J 2		OS: Lens material absorbed in 1 mo.; patient has continued school uninterruptedly since operation

Summary of 70 Cataract Operations Performed in Office—continued

Operation No.	Age & Sex Of Patient	Preoperative Condition	Date of Operation	Operation	Eye Operated On	Preoperative Vision	Postoperative Vision	Postoperative Complications	Comment
36 (25)	58 M	OD: Total opacity OS: Surgical aphakia	11/1/55	Intra-capsular	OD	OD: CF 2 M., J 6 OS: 6/6, J 4	OD: 6/15, J 4 OS: 6/6, J 3		
37	63 F	OU: Complicated nuclear opacity; high myopia (?)	11/5/55	Extra-capsular	OD	OD: CF 30.5 cm. OS: CF 1 M ., J 7	OD: CF, 1.5M.		OD need.ing 11/22/55; poor vision due to extensive white & pigmented atrophy including macular area
38 (43)	73 F	OD: Postcapsular & sector opacity OS: Nuclear opacity	11/5/55	Extra-capsular	OD	OD: CF 0.75 M. OS: CF 1 M.	OD: 6/12, J 3		
39 (34)	62 F	OD: Mature OS: Surgical aphakia	11/16/55	Extra-capsular	OD	OD: CF close OS: 6/10, J 2	OD: CF 1M.		OD: Friable capsule; fundus apparently normal
40 (33)	63 F	OD: Surgical aphakia OS: Late incipient	11/19/55	Extra-capsular	OS	OD: 6/6, J 2 OS: CF 3 M., J 2	OS: 6/10, J 2	OS: Secondary glaucoma following last needling, controlled by DEP b.i.d.	OS incision and irrigation 12/13/55; repeat needling 1/31/56
41 (48)	61 F	OU: Postcapsular opacity; cortex & nuclei clear	11/21/55	Intra-capsular	OS	OD: 6/60 OS: CF 61 cm.	OS: 6/12	OS: Small hyphema due to trauma	See Note 3
42	16 F	OD: Complicated; gray sectors & water clefts OS: Faint post-capsular polar opacity (slit lamp)	11/22/55	Discision followed by linear extraction after 11 days	OS	OD: 6/60 OS: CF 61 cm.	OD: 6/5, J 1		High school student; was not absent from school after either operation

43 (38)	73 F	OD: Surgical aphakia OS: Nuclear opacity	12/7/55	Extra-capsular	OS	OD: 6/12, J 3 OS: CF 1 M.	OS: 6/20, J 5	OS: Secondary glaucoma	OS: Tension controlled with DFP
44	72 M	OD: Surgical aphakia, hammock pupil (operated on in hospital by another surgeon) OS: Mature total	11/26/55 12/10/55	Radial incision Intra-capsular	OD OS	OD: CF 1.5 M. OS: CF 1.5 M.	OD: 6/10, J 2 OS: 6/10, J 2	OS: Small hyphema on 9th day; AC became shallow for 1 wk.	OD operation: Patient spent 40 days in hospital and was off work 3 mo. OS operation: Returned to work after 20 days with 6/15 vision OU
45	69 M	OD: Complicated OS: Incipient	12/13/55	Extra-capsular	OD	OD: No CF OS: No CF	OD: CF close (?)		See Note 4, test case
46	40 F	OD: Normal OS: Complicated; total gray	12/14/55	Intra-capsular after freeing synechiae	OS	OD: 6/10, J 2 OS: CF 33 cm.	OS: 6/10, J 4	Small hyphema 4th day, 1st dressing	Trachoma IV $\frac{\{+++|++\}}{\{\quad +|+\quad\}}$ See Note 5
47	71 F	OD: Surgical aphakia OS: Complicated; total opacity	12/15/55	Extra-capsular	OS	OD: CF 33 cm. OS: Accurate light projection	OS: CF 2.5M.	OS: Thick posterior capsular membrane left behind	Trachoma III $\frac{\{++|++\}}{\{\ +|+\ \}}$ OS needling 12/28/55, repeated 1/26/56 (see Note 6)
48 (41)	61 F	OD: Postcapsular opacity OS: Surgical aphakia	12/16/55	Intra-capsular	OD	OD: 6/60 OS: 6/26	OD: 6/15- OS: 6/12-	OD: Small iris prolapse due to trauma	OD: Prolapse repair 1/31/56 (see Note 3)
49	43 F	OD: Postcapsular opacity; cortex & nucleus clear OS: Total nuclear	12/19/55	Extra-capsular	OS	OD: 6/30, J 3 OS: Accurate light projection	OS: 6/10-, J 2	OS: Thick posterior capsular membrane	OS needling 1/10/56; tough membrane
50	55 F	OD: Atrophia bulbi OS: Complicated; total white opacity; leukoma adherens; secondary glaucoma	12/21/55	Intra-capsular after freeing synechiae	OS	OD: Nil OS: Accurate light projection	OS: CF 3M.		Trachoma III $\frac{\{++|++\}}{\{++|++\}}$ OS: Postoperative tension 1 plus; patient feels better with DFP, 1 drop each night

Summary of 70 Cataract Operations Performed in Office—continued

Operation No.	Age & Sex Of Patient	Preoperative Condition	Date of Operation	Operation	Eye Operated On	Preoperative Vision	Postoperative Vision	Postoperative Complications	Comment
51 (60)	65 M	OU: Mainly nuclear opacity; cortex rather clear	12/22/55	Extra-capsular	OD	OD: 6/60, J 5 OS: 6/50, J 4	OD: 6/20, J 4	OD: Opacity in descemet membrane began 13th day & gradually cleared in 3 wk.	OD needling 2/29/56
52	92 F	OD: Hypermature brown nucleus OS: Morgagnian	12/30/55	Intra-capsular	OD	OD: Accurate light projection OS: Accurate light projection	OD: 6/15, J 3		Oldest patient in series; deafness & kyphosis; never knew she had undergone operation (see Note 7)
53	49 F	OU: Senile nuclear opacity	1/5/56	Intra-capsular	OD	OD: CF 1.5 M. OS: CF 1.5 M.	OD: 6/10, J 2		B.P. 240/106
54	69 F	OD: Early ante & postcapsular opacity OS: Total post-capsular; nucleus clear	1/11/56	Extra-capsular	OS	OD: 6/20, J 2 OS: Accurate light projection	OS: CF 2M.		OS: No gross lesion in fundus; poor vision remains unexplained
55	66 F	OD: Few sectors opacity OS: Total opacity	1/21/56	Extra-capsular	OS	OD: 6/30, J 5 OS: CF 1 M.	OS: 6/10, J 2		
56	53 M	OD: Normal OS: Traumatic 6 days; metallic foreign body	2/15/56	Extra-capsular	OS	OD: 6/5 OS: Accurate light projection	OS: 6/15-, J 6		Retrieved metallic foreign body by dipping magnet into vitreous; uneventful post-operative course
57	27 M	OD: Injured 3 yr.; quiet; posterior synechiae: irregular pupil; sharp metallic foreign body retained OS: Normal	3/10/56	Intra-capsular after freeing of post-operative synechiae	OD	OD: Accurate light projection OS: 6/5, J 1	OD: 6/50		Foreign body not recovered in lens by magnet dipped into vitreous cavity; smooth healing, quiet eye: X rays show foreign body still present

58	41 M	OU: End stage uveitis; poliosis; vitiligo, dysycousia, etc. (Vogt-Koyanagi) sealed pupils, cottonlike lenses	3/10/56	Intracapsular together with triangular piece of pupillary membrane cut out	OS	OD: Accurate light projection OS: Accurate light projection	OS: only subjective improvement	Large pupil opening eventually sealed up again	Operation done for experiment only; smooth, uneventful postoperative course
59 (62)	13 M	OU: Thick yellow plaques; congenital cataracts needled (?) by quack in village	3/13/56	Cutting out the plaque scissors (?)	OS	OD: CF 3 M., J 4 OS: CF 2 M.	OS: CF 3M.		OS fundus: No visible pathologic change
60 (51)	65 M	OD: Surgical aphakia OS: Nuclear opacity	3/15/56	Extracapsular	OS	OD: 6/30, J 6 OS: 6/50, J 4	OD: 6/20, J 4 OS: 6/20, J 6	Total hyphema 8th day	OS needling 4/19/56
61 (6)	50 F	OD: Rapid total opacity after attack of glaucoma OS: Surgical aphakia	3/22/56	Extracapsular lower C. incision to avoid bleb	OD	OD: Accurate light projection OS: 6/5, J 1	OD: 6/50		OD: Acute attack of glaucoma 2/27/56, controlled by iridencleisis. OS: Quiet throughout. OU: Fundi normal
62 (59)	13 M	OD: See Operation 59 OS: Surgical aphakia	3/31/56	Discission	OD	OD: CF 3 M. OS: CF 3 M.	OD: 6/60		OD: fundus normal OU: Congenital amblyopia of undetermined cause
63 (69)	53 F	OD: Total white subluxated lens due to attempted couching in village OS: Ante-& postcapsular opacities	4/4/56	Couching	OD	OD: CF 2 M. OS: CF 1 M.	OD: 6/6, J 2		

Summary of 70 Cataract Operations Performed in Office—continued

Operation No.	Age & Sex Of Patient	Preoperative Condition	Date of Operation	Operation	Eye Operated On	Preoperative Vision	Postoperative Vision	Postoperative Complications	Comment
64	66 F	OU: Glaucoma absolutum; total nuclear cataract, frozen pupil, stone-hard	4/5/56	Broad iridectomy. Extracapsular	OD	OD: Accurate light projection OS: Nil	OD: CF close (?)		Test case (OS, Operation 75); smooth postoperative healing OU; normal tension resulted; no change in vision
65	76 M	OU: Senile nuclear opacity	4/6/56	Intracapsular	OS	OD: CF 10 cm. OS: Accurate light projection	OS: 6/15, J 2		
66	60 F	OD: Total mature OS: Normal	4/9/56	Extracapsular	OD	OD: Accurate light projection OS: 6/10, J 2	OD: 6/26, J 4	Corneal striae extend to center; clearing slow	
67	63 F	OD: Sector & postcapsular opacity OS: Total crystal-like	4/10/56	Intracapsular	OS	OD: CF 3 M., J 7 OS: Accurate light projection	OS: 6/10, J 4		
68 (81)	63 F	OU: Total nuclear opacity	4/13/56	Intracapsular	OD	OD: Accurate light projection OS: CF 30.5 cm.	OD: CF 2M. OS: CF 1M.		Trachoma III ⎧++++|++++⎫ ⎩+++|+++⎭ see Note 8
69 (63)	53 F	See No. 63	4/18/56	Extracapsular	OS	OD: 6/6, J 2 OS: CF 1 M.	OS: CF 1M.	Total hemorrhage OS 1 wk. after operation, due to "hitting eye with fan"	OS quiet; hyphema gone and vitreous hemorrhage probably in process of absorption; expect improvement in vision
70	73 F	OU: Hypermature cataract nigra	4/23/56	Intracapsular	OS	OD: Accurate light projection OS: Same	OS: 6/26, J 3		

Explanation of Table.—The operation numbers are given from 1 to 70 consecutively, one number to each eye operated on in my office. If the other eye of the same patient was operated on at a different date, the number of the second operation is given in parenthesis for reference.

Preoperative and Postoperative Vision.—Preoperative vision usually means naked vision that cannot be improved with a lens, but in certain cases it may be the vision obtainable with correction. Postoperative vision usually means corrected vision. It does not necessarily mean the best final vision, however, as in some cases the eye has not yet settled down or the patient has not yet appeared for the final refraction.

The notes with a reference number in the column headed "Comment" are cases in which fuller details of progress are given, because there are some special points of interest to bring out.

Note 1 (Operation 12).—A woman aged 74, living four stories above her own stationery store one block away from my office, was the patient. Because "there was no point in taking a taxi to go across the street," she walked all the way home after the operation. She went up and down the stairs the next morning to attend the cash register in the shop. The convalescent course was uneventful. Glycosuria was controlled by 20 units of insulin lente daily before the operation, and subsequently by 3 tablets of Lobulin (a pancreatic extract) up to the time of writing. She showed up with an attack of acute glaucoma in the left eye exactly two months after the operation. The glaucoma was quieted by DFP, 1 drop twice a day. The patient was again delinquent for half a year and then showed up with acute conjunctivitis in the left eye.

The right eye was quiet and pale; pupil dark, deep cupping of disc—glaucoma absolutum! The patient herself was not much concerned with the right eye, since vision in the left eye (6/15) was better than on her first visit. The conjunctivitis cleared up with antibiotics. Two weeks later there appeared an episcleritic nodule on the left eye, which responded immediately to topical cortisone. This case shows how severely complicated a cataractous eye may be and yet go through an office operation smoothly.

Note 2 (Operations 16 and 24). A woman aged 61 had an old trachoma IV with entropion, trichiasis, large leukoma adherens, anterior synechiae and ectasia of the corneas of both eyes, probably due to rupture of corneal ulcers in childhood.

This case demonstrates that in the presence of extensive trachoma both eyes can take a smooth course after operation for cataract. The fundi later become visible, showing extensive degeneration and macular atrophy, which, together with the corneal condition, account for the poor vision. The operation itself did not stir up any further complication.

Note 3 (Operations 41 and 48).—An apparently healthy housewife aged 61 lived 136 steps up a hill in a stone hut. On Nov. 21, 1955, operation was performed on the left eye (No. 41). On the seventh postoperative day the patient complained of pain due to hitting the left eye with her own hand. Examination showed the left eye in good condition. On the tenth day, pain, again due to hitting the left eye while asleep, was mentioned. There was a small hyphema. The pupil was clear, round and in the center; tonometer tension was normal, and the patient could count fingers at 33 mm.

On December 16 the right eye was operated on (Operation 48). On the third postoperative day the patient complained of pain in the right eye, saying that it had hit against the bedpost. Examination revealed nothing unusual in the right eye; the patient could distinguish fingers close to her. On the twelfth day the right pupil was noticed to be drawing up a bit. There was a tiny iris prolapse on the nasal side. With the right eye the patient could count fingers at 0.75 M. The fundi were normal. On Jan. 17, 1956, refraction showed:

O.D. + 8.00 c — 4.50 CX 165 = 6/15
O.S. + 6.50 c + 5.50 CX 180 = 6/12

On January 31, excision and repair of prolapse of the right eye were done. On February 10 the patient left the hill and went to a village thirty miles away. There she had high fever for several days, probably malaria (prevalent). On March 5 the right pupil was drawn up and totally sealed. The repaired prolapse was flat. Accommodation and tonometer tension were normal. Light projection

was inaccurate. The left pupil was centrally dark, but there was no light reaction. Tonometer tension was normal. The right fundus was gray, with no details. Observable light projection was inaccurate.

By March 19 the patient was having periods of loss of consciousness and was hospitalized and cared for by the Medical Service. Physical and laboratory examinations gave negative results. (The erythrocyte count was 3,500,000 per cubic millimeter of blood.) The patient was sent home after one month's bed rest and diet. Her condition remained unimproved. It seems that everything unfortunate can happen to one person at a single time. The place and manner in which the cataract operations were done, however, had nothing to do with the misfortunes of this patient. On June 5 her general health was improving, but she could not walk because of weakness of the legs (no paralysis). The right pupil was sealed. In the left eye there was a thin gray membrane over the central round pupil. Both eyes were quiet, and tension was soft. Discission with the Ziegler knife was done in the office, both eyes at one sitting. The patient was immediately able to count fingers at 0.5 M. On June 18, 1956, vision in the right eye enabled her to count fingers at 2 M., and in the left eye, at 1 M. My writing ends here, but her story is still going on.

Note 4 (Operation 45).—This was a test case. The patient had high myopia and ("thirty years ago had used 17.00 D. lenses") and severe trachoma IV. Entropion and trichiasis were present, with a heavy active pannus. The patient had been under my care since 1951, at which time vision in the right eye enabled her to count fingers at 0.5 M.; in the left eye, at 1 M. The right eye showed a dark brown cataract; the left, a gray one. The fundi were invisible. Multiple minor operations were done by me through the years. On Nov. 16, 1955, there was an attack of acute iritis in the right eye, and the pupil was refractory to atropine. The trachoma also became active. The patient was unable to count fingers with either eye. In both eyes the intraocular pressure (Shiotz) was 12 mm. of mercury. Dec. 13, 1955, extracapsular extraction of the cataract in the right eye was done to see what would happen. The capsule was friable, and a black nucleus was easily delivered, much cortex being left behind. Healing was quick and uneventful. There is no appreciable improvement in vision, but patient says it is subjectively better. The pupil is dark; a R.R. is present, but no details in the fundus. Thus a cataract patient with high myopia, severe trachoma and acute iritis went through an office operation without any further complication.

Note 5 (Operation 46).—For eight months, off and on, a patient came to me with a left eye showing keratitis, iritis, secondary glaucoma and, at one time, no vision. Trachoma IV was present. There was chronic dacrocystitis, with a yellow discharge. The cataract developed into a total uniform gray opacity. Dacryocystectomy was done three weeks before cataract extraction. Quick, uneventful healing followed intracapsular extraction. Results: Tension normal; left eye, 6/10, Jaeger 4.

Note 6 (Operation 47).—The patient in this case had uveitis. A physician in a government hospital had operated on the right eye for cataract six months earlier. The iris was atrophied. The pupil was adherent to a thick pupillary membrane. There was mild ciliary injection. Vision in the right eye enabled the patient to count fingers at 33 cm.

Acute iritis of the left eye was observed three weeks prior to the time of writing; it is now quiet after treatment. The lens shows total nuclear opacity, with a friable capsule. Discission of the posterior membrane had to be done twice. As to the fundus, dirty floaters are present in the vitreous; no detail is discernible. Vision in the left eye enabled the patient to count fingers at 1 M.; with correction (+10.00), at 2.5 M.

The preexistent chronic uveitis of undetermined cause explains the poor visual results in this case, which shows that in the presence of chronic iridocyclitis the result of a cataract operation, good or bad, is about the same whether it is an office procedure or is performed in a hospital.

Note 7 (Operation 52).—This patient, the oldest in the series, had senile hypermature cataract nigra. She had been brought out from the village for treatment. She is deaf, and the family shouts into her ears. I had no aural or visual communication with her. She has kyphosis and can neither stand nor lie straight. Extraction of the cataract from her right eye was done entirely without her knowledge or consent, before or afterward, to anything in the nature of an operation. She took it to an "eye washing" and under-

stood that she was to be propped up in cushions to have it done. She behaved quite well, and the operation went smoothly. At the end of three weeks a —10.00 lens was arbitrarily prescribed for her to pass the approaching Chinese New Year. Later the eye had 6/15 vision, Jaeger 3.

Operation on the left eye was done on April 25, 1955 (Operation 72). The patient did not realize that one operation had taken place and that a second one was about to be done. She was in a healthier physical condition by this time, probably owing to better food; she was more articulate, and objected more strongly to being put on the operating table. She cried out at the needle prick that initiated the akinesia. The operative procedure was quick and smooth, and a monocular pad with a shield was put on. The patient objected to my putting a pad on the right eye. She had to walk 100 yards to reach the taxi stop (the traffic police had lately put up a railing). When I left the office myself, I discovered her taking advantage of the fact by lingering to look at every shop window along the sidewalk. Her family could not get her to move away from the glittering displays in the big shop windows.

Note 8 (Operations 68 and 81).—A patient with severe trachoma has been under my care for the past seventeen years. Deformity of the lids and lagophthalmos are present, owing to "quack" operations performed in the patient's youth. Entropion and trichiasis are present, with a heavy pannus and thick corneal scarring. Bilateral dacrocystectomy was done in 1942. Cataracts have slowly developed during the past ten years. Operation on both eyes went smoothly, and the postoperative courses, despite the presence of such long-standing sequelae of trachoma, were uneventful. Both eyes have gained some useful vision, whereas before the operations the patient was considered blind.

COMMENT

This series of cataract operations done in the office has answered my question as to whether such a procedure really increases the operative risk or not. Heretofore it has been assumed that there is an undue risk when the patient is allowed up immediately after the operation; therefore, all cataract patients must be hospitalized for ten or fourteen days, and certain restrictions have been arbitrarily set up for the patient to observe and the nurse to enforce. These are confinement to bed for days, the use of sandbags to immobilize the head, special nurses, a bedpan, a dark room, sedatives, liquid diet, etc., all of which are unnecessary, at least to a certain degree.

Permission to walk or go slowly up and down the stairs immediately after the patient leaves the operating table causes no untoward complications. The risk, if any, is perhaps increased by the possibility of an accident on the way home, for on the crowded streets many things can happen even to a healthy pedestrian. A number of patients have taken the test under unintentionally extreme conditions. I did not expect a patient to climb a hill right after the operation, yet more than one did exactly that, without untoward results. Some may ask, "If there should be any complication during the operation, would not the risk be many times increased when the patient is allowed to walk home?" I suppose the penalty for any mistake or complication in the operation itself—for instance, a hemorrhage or a loss of vitreous—would be increased, but again that is only an assumption yet to be confirmed. In this series there has been no such case, so I really cannot say. Perhaps eventually someone will present a series of cases to show whether it is true. Only then can one really know.

Of the 70 eyes operated on, about half belong to my private patients and the other half to free patients. Among the patients are listed a vegetable seller, a fisherman, a pauper, merchants, a retired Nationalist general, a metal craftsman and a clerk in the Courts. There is apparently no age limit for the operation performed in the office. Every decade of life is represented in my series of cases,

a range from 3 years of age to over 92. Babies are the easiest to handle provided the parents are not allowed to interfere by their presence; they do not cry or wriggle half as much when the nurse holds them as when the mother does. Old patients are also docile and calm and have much understanding of what the doctor is about to do to them and for them. The younger patient is more apprehensive and less trusting and is apt to do things unexpectedly on the operating table. I had selected these too with greater distrust, and had excluded not a few adolescents for whom I insisted on general anesthesia in the hospital rather than give them the chance to prove that my suspicion was wrong.

Practically all common or uncommon types of cataract are represented in this series. There are congenital, traumatic, high myopic, diabetic, glaucomatous, new and old iridocyclitic, senile premature, mature and morgagnian cataracts, and, for good measure, some extreme cases of multiple complications especially selected for this experiment (see table and footnotes.) It is shown that the condition of the cataract is no contraindication to extraction in the office. Every one of the complicated cataracts ran an uneventful postoperative course, healing required no more time, and the visual results did not disappoint my expectation. In some cases the underlying pathologic change causing the complicated cataract could not be determined, but no postoperative course turned out to be complicated because the operation was performed in the office.

In this endemic region, severe trachoma frequently complicates all kinds of diseases of the eye. Thick conjunctiva, a heavy pannus, corneal infiltrates and a mucous discharge are always present. I find that if an entropion is not actually brushing on the cornea, if the tear sac is not regurgitating on pressure, and if any probable secondary infection has been treated for a while with antibiotics, a cataract extraction can be done with total disregard of the presence of trachoma in any stage (see Notes 4 and 8).

Couching was done in 1 case (No. 63), in which the cataract was already partially luxated in a previous attempt at couching by someone in the village. I merely completed the original intention by pushing it into the vitreous. The result was immediately perfect and lasting. I have had opportunity to see some wonderful results, and a few disastrous ones too, of couching as done by persons we choose to call quacks. There is practically no postoperative reaction; the pupil is round, and the vision is perfect. The good result is permanent. It seems to me that the whole secret lies in avoiding any injury to the lens capsule. Once the capsule is broken open, the lens will imbibe fluid and a severe reaction, with secondary glaucoma, ensues. The eye is otherwise as kindly tolerant of the cataract in the vitreous as of the cataract in its natural position behind the pupil. Couching is the operation of choice in case the surgeon has no roof overhead that he can call his office, let alone a hospital. It can be performed under a tree, in a corner of the market or out in the wilderness. It is cataract surgery al fresco, so to speak. It requires minimal preparation and manipulation—a charcoal flame to heat up the gold or silver needle and a few drops of a local anesthetic, probably cocaine; and it needs no dressing afterward. Couching is imperative if the doctor does not expect ever to see his patient again. Frequently after the operation the patient will disappear, or the doctor will disappear, or both will disappear, each going along his own path never to meet again. Readers of this journal may think it strange and look at me askance, but I can assure them that

more than half of all the cataract operations in this world today are being done by the couching method. I consider the result, on the whole, good. It is bad only when the surgeon selects his cases unwisely and his technic lacks skill. Is this not true also of modern surgeons in modern hospitals?

It follows that many other intraocular operations can be done safely as office procedure. Any ophthalmologist can do the cataract extraction. I do not claim any special technic or adeptness. Other possibilities are iridectomy, operations for glaucoma, repairs of injuries and removal of foreign bodies, all of which have long since become office routine with me; likewise, operations for squint, enucleation and exenteration of the globe and almost every extraocular procedure are all done in the office today. In my opinion certain corneal transplantations, as well as diathermy for retinal detachment, can also be done in the office.

SUMMARY AND CONCLUSIONS

The patients in 70 consecutive cases of various types of cataract, aged from 3 to 92 years, from all walks of life, have been operated on by the author as an office procedure. The results are shown in tabulated form. This investigation was done to find out whether such a procedure carries any greated risk than does a hospital procedure. The tests turned out to be unintentionally severe. The results proved that there is no greater risk.

The author does not advocate the use of this procedure by everyone; he only states that it can be done, and with reasonable safety. He has no wish to swing the surgical treatment of cataract from one extreme to the other, but in his opinion it can be modified sometimes to suit the situation, the locality, the preference of the surgeon or the pleasure of the patient. Some large clinics may make it an O.P.D. operation, or some may just shorten hospitalization or simplify postoperative nursing. The author himself is obliged by circumstances to make it an office routine. The results have changed his earlier conviction that he would require an ophthalmic hospital to carry on his work.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Der Verfasser hat in 70 aufeinander folgenden Fällen an Kranken aus allen Gesellschaftsklassen im Alter von 3 bis 92 Jahren Operationen wegen verschiedener Formen von Katarakt in der Sprechstunde ausgeführt und stellt die Ergebnisse in Tabellenform dar. Er beabsichtigt, mit dieser Arbeit ausfindig zu machen, ob ein solches Verfahren ein grösseres Risiko in sich trägt, als wenn die Operation im Krankenhaus ausgeführt wird. Die Ergebnisse zeigen, dass das nicht der Fall ist.

Der Verfasser hält es nicht für ratsam, dass jeder seinem Vorgehen folgt. Er beschränkt sich darauf festzustellen, dass sich die Operation in dieser Weise mit annehmbarer Sicherheit ausführen lässt. Es liegt ihm fern, in der chirurgischen Behandlung des Katarakts von einem Extrem ins andere zu wechseln, glaubt jedoch, dass der Vorgang manchmal je nach der Situation, den lokalen Verhältnissen und den Wünschen des Patienten modifiziert werden kann. Manche grossen Kliniken könnten die Operation in der ambulanten Abteilung ausführen, andere vielleicht nur den Krankenhausaufenthalt abkürzen oder die postoperative Behandlung vereinfachen. Der Verfasser selbst ist durch äussere Umstände gezwungen, den Eingriff in der Sprechstunde auszuführen. Die Ergebnisse haben seine frühere Ansicht, dass er für diese Operation ein ophthalmologisches Krankenhaus braucht, geändert.

RÉSUMÉ ET CONCLUSIONS

L'auteur présente une étude sur 70 cas de divers types de cataractes (malades de 3 à 92 ans appartenant à toutes les classes sociales), opérés ambulatoirement. Il désirait comparer les risques d'une telle méthode avec ceux de l'opération pratiquée en clinique. Les résultats obtenus montrent que le risque n'est pas plus grand.

Le but de l'auteur n'est pas de recommander la généralisation de cette pratique; il démontre simplement qu'elle est possible, avec une marge de sécurité suffisante. Son intention n'est nullement de bouleverser le traitement chirurgical de la cataracte et d'aller d'un extrême à l'autre, mais il estime que celui-ci peut être adapté aux exigences particulières de chaque cas. Les circonstances dans lesquelles il se trouve placé obligent l'auteur à pratiquer l'opération de la cataracte à son cabinet, et les résultats obtenus ont modifié sa conviction première qu'il lui fallait une clinique ophtalmologique pour pouvoir poursuivre son travail.

CONCLUSIONI RIASSUNTIVE

L'autore ha operato la cataratta in 70 soggetti di età varia fra i 3 e i 92 anni, e presenta i risultati in una tavola. Questo studio è fatto allo scopo di dimostrare se l'intervento fatto ambulatoriamente presenta maggiori rischi di quello fatto in ospedale, e dimostra che il rischio è lo stesse.

Questo non significa che tutti siano in grado di operare così; l'autore vuol soltanto sostenere che ciò può essere fatto con un ragionevole limite di sicurezza. Non vuole neppure modificare radicalmente i concetti sulla terapia chirurgica della cataratta; semplicemente questi principii possono essere modificati a seconda delle situazioni del posto in cui ci si trova, delle preferenze del chirurgo e di quelle del malato. In qualche grande clinica l'intervento può diventare, come regola, ambulatoriale, in altre può abbreviarsi il periodo di ospedalizzazione, in altre ancora essere semplificato il trattamento post-operatorio. Quanto all'autore, egli è stato costretto dalle circostanze a farne un intervento, di regola, ambulatorio — e i risultati lo hanno persuaso di poter fare a meno di un ospedale per compiere il suo lavoro.

RESUMEN Y CONCLUSIONES

El autor ha operado en su consulta (sin hospitalización) 70 casos consecutivos de cataratas de diversos tipos en enfermos entre 3 y 92 años. La cuestión está en determinar si esta técnica ambulatoria lleva consigo mayores riesgos que el procedimiento de hospitalización. Los resultados prueban que no existe un riesgo mayor.

El autor no aconseja el uso del método en todos los casos; solamente afirma que puede llevarse a cabo con razonable reguridad. No pretende llevar el tratamiento de la catarata desde un extremo al otro, pero en su consepto el proceder puede ser modificado algunas veces sigún la situación, la localidad, la preferencia del cirujano o el gusto del enfermo.

Algunas grandes clínicas pueden hacer de esta operación un procedimiento ordinario de hospitalización, o bien pueden acortar el tiempo de entrenamiento o simplificar los cuidados postoperatorios. El propio autor se ha visto obligado a hacer la operación ambulatoriamente para adaptarse a la circunstancias, y los resultados le llevaron a modificar su anterior convicción de la necesidad de un hospital oftálmico para llevar a cabo su trabajo.

Anesthesia in Cataract Surgery

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EMOTIONAL distress unrecognized or unchecked in the surgical patient often gives rise to complications that undo the skill of even the most experienced surgeon and convert a successful operation into a dismal failure in spite of expert postoperative care. Coping with anxious and apprehensive patients about to undergo operations, especially serious ones, is a problem frequently encountered in the surgical treatment of cataract. Two English investigators, Nutt and Wilson,[1] observed that the preoperative use of Thorazine in surgical treatment of the eye helped considerably to relieve apprehension, anxiety and restlessness. Taking a cue from them, we used the drug, but with less successful results. Only half of the patients in our pilot series of 10 patients were adequately sedated for operation. The others, though relaxed, were alert and, on occasion, moved spontaneously in such a way as to interfere with the course of the operation.

By altering the regimen, chiefly the time of administering Thorazine and other preanesthetic medicaments, I have found a means of substantially improving our results. With the new regimen, outlined in Tables 1 to 3 inclusive, almost all of the next 60 patients undergoing cataract extractions were adequately sedated, relaxed and emotionally calm.

In no case did we notice an undue drop in blood pressure or unusual pallor. Temperature, pulse and respiratory rate were all within satisfactory limits for surgical patients ranging in age from 55 to 91 years. Our observations bear out those of others who have reported that Thorazine potentiates the action of such drugs as Demerol and barbiturates and permits a reduction of approximately one-half the usual amounts of these agents when used in conjunction with Thorazine. Only 50 per cent of the patients required Demerol for postoperative pain, and only 25 per cent required a second dose. Only 1 patient had mild nausea, which quickly subsided. In another, however, frank nausea and vomiting occurred and, on administration of a second dose of Thorazine, became aggravated. Since a drug reaction was suspected, the patient was given Chlor-Trimeton (10 mg., intramuscularly), which apparently relieved nausea and vomiting and prevented possible damage to the patient's eye.

Subsequent experience indicated that Chlor-Trimeton (10 mg.), given preoperatively and postoperatively, apparently reduced drug reactions and lessened gastrointestinal disturbances. Having the patient fast for twelve to fourteen hours and keeping fluids to a minimum prior to the

TABLE 1.—*Schedule for Day Before Operation*

1.	Necessary laboratory tests
2.	Medical consultation when indicated
3.	Thorazine, 25 mg. b.i.d., by mouth
4.	Two cc. (80 units) ACTH intramuscularly
5.	Albapenicillin, 250 mg. (1 q.i.d. + by mouth)
6.	Neo-hydeltrasol solution ½ per cent (two drops O.U. 4 times a day)
7.	Full diet
8.	Ambulatory
9.	Nembutal grains 1½ at hour of sleep

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operation had a beneficial effect in reducing postoperative nausea and vomiting.

After administering Thorazine to 60 patients, we substituted a chemically related compound, Compazine, which had proved, milligram for milligram, to be more potent as an antiemetic and tranquilizing agent in animal studies. Moreover, it appeared to be less likely to produce hypotension or potentiate depressants of the central nervous system. Compazine (10 mg., orally) was given the day before the operation, and again (10 mg., i.m.) thirty minutes before the operation to 20 patients undergoing cataract extrac-

TABLE 2.—*Schedule for Day of Operation*

1. No breakfast or lunch; fluids restricted to a minimum
2. *One hour before operation*
   Nembutal, 1½ to 3 gr. (by mouth), depending on weight of patient. Demerol, 100 mg., intramuscularly

   Thirty minutes before operation
   a. Thorazine, 25 mg. intramusclarly
   b. Chlor-Trimeton, 10 mg. intramuscularly

   In operating room before operation
   Local anesthesia
   Tetracaine 0.5 per cent is used for topical anesthesia. Tyzine solution is used to blanch the conjunctiva, when conjunctiva is injected. The lid block is produced by injection of 2 per cent procaine hydrochloride in which epinephrine and hydase were dissolved, according to the method of Atkinson. The solution is injected subperiosteally at the outer canthus. This procedure sometimes is known as the King's County technic. Retrobulbar nerve block is produced by injection of 1 cc. of the aforementioned procaine solution, retrobulbarly

   In the operating room during the operation
   Continuous drip of 5 per cent dextrose intranvenously. The diluted Demerol (100 mg. ampule dissolved in 18 cc. of saline solution) is given slowly in the first part of surgery, intravenously by the anesthetist. Just prior to the extraction of the lens, the remainder of the Demerol solution is given rapidly, if necessary
   The lens is removed by capsule forceps or erisophake, usually without interference from the patient

TABLE 3.—*Postoperative Schedule*

As soon as the patient is returned, 10 mg. of Chlor-Trimeton is given, intramuscularly
Demerol 50 mg. intramuscularly, to be given only when patient complains of pain during the first twenty-four hours
Nembutal (grains 1½) is given at hour of sleep (by mouth)
Soft diet to full diet
Elevation of head of bed

tions. Approximately half of them required additional sedation and Demerol in the operating room to induce the desired stage of peaceful sleep. To be sure, all were emotionally calm, but we prefer the patient to be in a somnolent state. In fact, many of the patients given Compazine were actually wide awake, exhibiting very little signs of the central depression while apparently free of apprehension. From our findings, it seemed evident that Compazine lacked the potentiating effect of Thorazine on barbiturates, narcotics, and anesthetics. No noticeable fall in blood pressure occurred in the Compazine-treated patients. No nausea and vomiting was observed so the drug appeared to be as effective an antiemetic as Thorazine.

In this series of 80 patients (60 on Thorazine, 20 on Compazine) we encountered no jaundice, no mortalities and no loss of eyes due to the surgical procedure, nausea, vomiting, psychosis or other factors.

SUMMARY

An anesthetic and analgesic technic for intraocular operations using Thorazine or Compazine, is described.

In the author's experience, Thorazine had beneficial drug-potentiating effects. Decreased amounts of narcotics were used postoperatively in the first group of patients. Thorazine had a hypotensive effect, beneficial to hypertensive patients with cardiovascular disease. There was

no noticeable hypotensive effect with Compazine.

The tranquilizing effect of Thorazine and Compazine appeared to be equal and satisfactory in the recommended doses.

Compazine fell short in its peaceful, sleep-producing effect as compared with Thorazine.

The authors express the opinion that the use of Chlor-Trimeton (10 mg. intramuscularly, preoperatively and postoperatively) had a beneficial effect in the control of drug reactions and gastrointestinal disturbances.

The use of diluted Demerol intravenously during the operation and especially preceding the lense extraction as aforedescribed had a most beneficial effect, at the same time accurately controlling the necessary amount of medication in each case.

RESUMEN

Se describe un método para llevar a caba la anestesia y analgesia en operaciones intraoculares, empleando para ello la Toracina de Campacine.

Según la propia experiencia del autor, la Toracina es un potenciador eficaz de otras drogas, de forma que en un primer grupo de pacientes en el que se empleó este medicamento, los narcóticos postoperatorios se administraton en dosis más bajas de lo corriente.

La Toracina es tambien un hipotensor que beneficia a los sujetos hipertensos que tienen enfermedades cardiovasculares. No se ha demostrado este poder hipotensor en la Campacina, aunque el efecto tranquilizador es análogo, usando las mismas dosis en ambus drogas.

Sin embargo el grado de narcosis alcanzado por la Toracina está por encima del que se alcanza con la Campacina.

El autor opina que para controlar eficazmente los efectos secundarios de las drogas (reacciones y alteraciones gastrointestinales) debe usarse el Clortrimeton (10 mg. por vía intramuscular antes y después de la operación). A la vez, para controlar las dosis medicamentosas necesarias en cada caso concreto, es inútil el empleo de Demerol intravenoso durante la operación, especialmente antes de efectuarse la extracción del cristalino como se describe algo más arriba.

ZUSAMMENFASSUNG

Die Verwendung von Thorazin und Compazin zur Anästhesie und Analgesie bei Operationen innerhalb des Auges wird beschrieben.

Die Erfahrungen des Verfassers zeigen, dass man aus der Eigenschaft des Thorazins, die Wirkung von Medikamenten erheblich zu verstärken, ausnützen kann. In der ersten Gruppe seiner Patienten wurden nach der Operation herabgesetzte Mengen von Betäubungsmitteln verabreicht. Thorazin hat einen blutdrucksenkenden Effekt, was Kranken mit kardiovaskulären Störungen und hohem Blutdruck zugute kommt. Mit Compazin liess sich keine bemerkenswerte Blutdrucksenkung feststellen.

Der beruhigende Einfluss war bei Anwendung der vorgeschlagenen Dosen zufriedenstellend und gleichwertig beim Thorazin und beim Compazin.

In der Herbeiführung friedlichen Schlafes war das Compazin dem Thorazin unterlegen.

Der Verfasser ist der Ansicht, dass die Verwendung von Chlortrimeton (10 mg intramuskulär vor und nach der Operation verabreicht) einen günstigen Einfluss auf die Kontrollierung von Arzneireaktionen und Magendarmstörungen ausübt. Die intravenöse Anwendung verdünnten Demerols während der Operation und besonders vor dem Herausziehen der Linse war von äusserst nützlicher Wirkung und gestattete in jedem Fall eine genaue Kon-

trollierung der erforderlichen Mengen von Medikamenten.

RIASSUNTO

Viene descritta una tecnica di anestesia e analgesia mediante Thorazina, per gli interventi intra-oculari. Questo farmaco ha la capacità di potenziare l'effetto di altre droghe e pertanto l'autore ha potuto usare dosi sempre minori di narcotici; esso inoltre ha un'azione ipotensiva, che si rende utile negli ipertesi con malattie cardio-vascolari. Tanto la Thorazina quanto la Compazina hanno un'azione tranquillizzante soddisfacente ed equivalente. Ques'ultima ha però un'azione più breve.

L'uso del Chlor-trimeton alla dose di 10 mgr. per via intramuscolare, prima e dopo l'intervento, ha un effetto benefico perchè impedisce reazioni e disturbi gastro-intestinali. L'uso del Demerol endovena durante l'intervento e soprattutto durante l'asportazione del cristallino ha pure effetti benefici.

SUMARIO

Descreve as tecnicas de anestesia e analgesia para operações intra-oculares usando Thorazine de Compazine.

Na opinião do A. a Thorazine demonstra efeito potencializador. Quantidades menores de narcoticos foram usados no primeiro grupo pós-operatorio de pacientes. Existe um efeito hipotensor da Thorazine que é benefico aos doentes hipertensos. Não há efeito hipotensor apreciavel com a Compazine.

Nas doses recomendadas os efeitos tranquilizadores desses produtos se equivalem. Compazine se mòstra mais suave que a Thorazine.

O A. diz que o uso de Chlor-Trimeton (10 mgrs. via intramuscular, no pré- e pés-operatorios) exerce efeitos salutares no controle dos reações medicamentosas e nos disturbios gastrointestinais.

Diz que o uso do Demerol diluido na veia durante o tempo da extirpação do cristalino é recomendavel e que reduz sensivelmente as quantidades de medicação soporífica.

RÉSUMÉ

Une technique d'anesthésie et d'analgésie pour les opérations intra-oculaires est décrite (Thorazine-Compazine).

La Thorazine a donné de bons résultats et a permis de diminuer les doses de narcotiques post-opératoires dans le premier groupe de malades. Elle a un effet hypotenseur (non constaté avec la Compazine), précieux chez les malades hypertendus avec affections cardiovasculaires, et exerce une action calmante.

L'utilisation de Chlor-Trimeton (10 mg intramusculaires aux stades pré- et post-opératoire) a donné de bons résultats quant au contrôle des réactions aux drogues et aux troubles gastro-intestinaux.

Le Demerol dilué intraveineux s'est révélé très utile, administré pendant l'opération, et surtout avant l'extraction de la lentille.

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Primary Osteogenic Sarcoma of the Large Toe

Report of a Case

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MALIGNANT tumors of primary origin in the bones of the foot, as well as of the hand, are extremely rare. Considering the fact that of the 206 bones in the entire skeleton 106 are in the hands and feet, the rarity of malignant primary bone tumors in the hands and feet is further impressed upon one. Coley and Higenbotham in 1939 reported that, in a total number of 1,211 cases of tumors of the hands and feet observed in the bone tumor department of the Memorial Hospital and the Hospital for Special Surgery in New York over a period of eighteen years, there were only 12 cases of osteogenic sarcoma. They further pointed out that the outstanding presenting symptoms consisted of pain and swelling in the region affected, followed by disability. They described the swelling as quite hard and increasing rapidly. They reported also that the roentgenograms in most of the cases they studied showed characteristic bone destruction with laying down of new bone, and in most cases a sunburst appearance was noted. They considered amputation the treatment of choice. Local excisions and resections, with or without irradiation, had been tried, but the number of five year cures was extremely low.

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Schreiner and Wehr reported a survey of 10,459 malignant tumors over a period of nineteen years and could find only 37 cases involving the foot, only 4 of which were sarcomas. Meyerding, in October 1938, stated that over a period of twenty-six years, 216 cases of osteogenic sarcoma had been observed at the Mayo Clinic; of these, 187 were confirmed by microscopic verification. In the remainder, the diagnosis was based upon clinical and roentgen data. Of the 187 cases in which the diagnosis had been proved microscopically, 6 of the tumors were reported as occurring in the feet, a total of 3.3 per cent. This particular article does not state which bones of the foot were involved.

Of the 4 sarcomas of the foot reported by Schreiner and Wehr in December 1937, 1 occurred in a girl 19 years of age, in whom the os calcis was affected. She was treated by irradiation and filling of the bone cavity with bone chips; finally, however, the leg had to be amputated, and the patient died four years later. The second case involved the os calcis of a 17-year-old boy who died two years later with extensive metastases. The third case is that of a 34-year-old woman *in whom the lesion originated in the large toe.* The patient was reported as well five years after removal of the tumor and roentgen therapy. The fourth case involved the

Fig. 1.—Feet of 16-year-old girl, showing large primary osteogenic sarcoma of large toe.

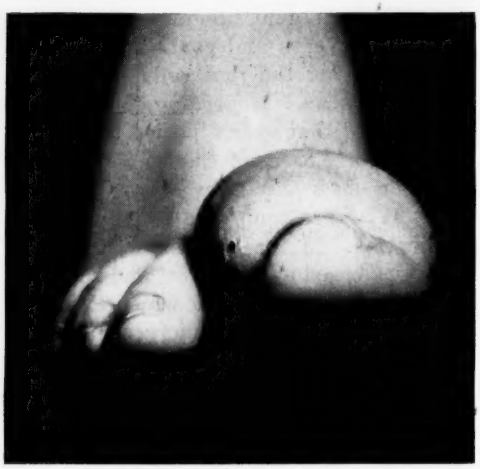

Fig. 2.—Anterior view of right foot, showing size of sarcoma.

first metatarsal bone of a 32-year-old man treated by curettage and irradiation, with survival six years after the original treatment.

Willis Campbell, in October 1935, reported a study of 86 primary malignant tumors of bone. Only 1 affected the foot, and this was in the first metatarsal bone. A review of many reports in the literature makes it obvious that primary malignant tumors of the foot are rare, and that malignant bone tumors of the toes are extremely rare.

To the small number of cases that have been reported in the literature, I wish to add the case of a 16-year-old white girl in whom a primary osteogenic sarcoma of the right large toe developed. The case is considered unique—first, because osteogenic sarcoma is extremely rare in toes; second, because metastases developed eight months after a midthigh amputation, and third, because the patient is living and well seven years and two months after excision of the metastatic lesion and almost eight years after the amputation.

REPORT OF CASE

The patient, a 16-year-old white girl, was first seen in my office on March 29, 1950, complaining of periodic swelling of the right large toe of approximately four years' duration. She stated that she had first noticed some swelling in the right large toe in January, 1946, without any history of injury. The swelling subsided after a few days. She reported further that the swelling had recurred every six to eight months, only to disappear after three or four days on each occasion. The swelling of the large toe had reappeared three months prior to my seeing her and had continued up to the time that I saw her. She had no pain and insisted that she had never hurt the toe.

Examination at this time revealed the patient to be well developed, well nourished and cooperative. General physical examination gave negative results except for a definite large swelling involving the entire large right toe (Figs. 1, 2 and 3). In particular, there were no palpable glands in the popliteal space or the groin. Roentgenograms were taken of the right foot and the left foot for comparison. Those x-rays of the right large toe revealed a considerable amount of soft tissue reaction, together with some areas of sclerotic bone with sunburst rays coming out from each side of the toe (Figs. 4, 5 and 6). Because of this the patient was admitted to the Rhode Island Hospital on March 30, and further studies were carried out.

Complete laboratory tests were made, including alkalin and acid phosphatase, blood urea nitrogen, blood dextrose, blood plasma protein, blood counts, urinalyses, sedimenta-

tion rates, etc. The results of all were normal except for a corrected sedimentation rate (30 mm. in one hour). Further roentgenograms taken at Rhode Island Hospital of bones of the right foot were interpreted as revealing either a chondrosarcoma or a Ewing sarcoma of the right large toe. A metastatic survey was done, but the results were negative.

Because of the fact that the diagnosis was not definite, an operation was done on April 30, at which time the entire proximal phalanx of the right large toe, together with the soft tissue swelling, was removed. At operation, the soft tissue was observed to be well separated from the adjoining tissues. The soft tissues making up the swelling could easily be separated and peeled from the adjoining tissues. In other words, there appeared to be a sharp line of demarcation between the soft tissue swelling and the adjoining tissues. The operation was done with aid of a pneumatic tourniquet. Postoperatively the patient ran a smooth course except that the skin over the dorsum of the large toe became slightly necrotic and began to slough. The specimen was submitted to the pathology department, and the following microscopic report was made: "The specimen consists of a proximal phalanx. On one surface there is attached a soft part tumor that measures 6 cm. in its greatest diameter. The surface is pink-tan, smooth and glistening. It appears to be fairly well circumscribed. It is firm to palpation. On section the tumor presents a pink-tan, finely granular, glistening surface that does not evert or retract. On sectioning through the long axis of the bone, the tumor appears to be firmly attached to the bone and no cortex can be definitely made out.

Sections of the bone show thickened bone trabeculi shading into fibromyxomatous tissue and rare focal collections of cartilage. Interspersed are large masses of cells consisting of oval nuclei about twice the size of a lymphocyte and with scant cytoplasm. The nuclear chromatin is slightly clumped. There is eosinophilic hyaline material interspersed between the cells, this hyaline material being presumably osteoid. The soft tissue contains masses of cells similar to those in the bone, but except for scant fragments of eosinophilic material, that of osteoid, there is no evidence of bone formation.

"These sections are, therefore, sections of a malignant bone tumor which, since it shows attempts at differentiation along the lines of bone, must be classed as an atypical osteogenic sarcoma. The large masses of oval cells are reminiscent of a Ewing tumor of bone, and, although this diagnosis was first made, after further study of the material it is considered less likely. *Diagnosis*: Osteogenic sarcoma of the proximal phalanx of large toe." (See Figure 7.)

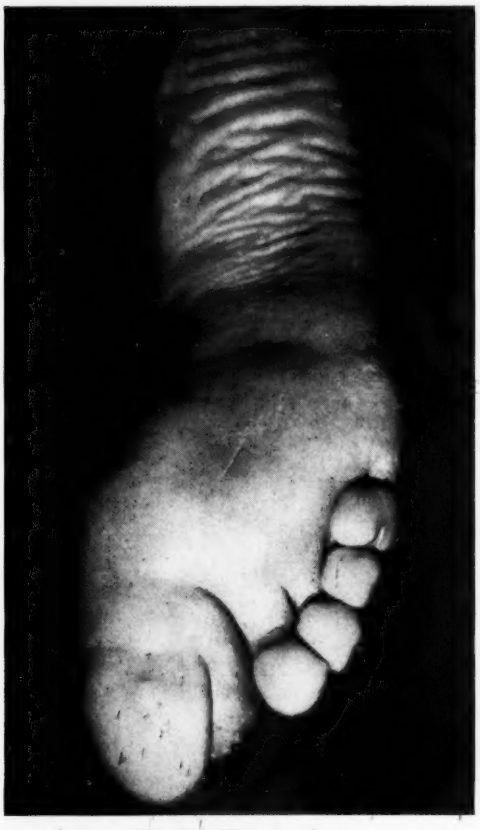

Fig. 3.—Plantar view.

Because of the seriousness of the situation, the patient's family asked for a consultation; consequently, the patient was transferred to the Lahey Clinic for this purpose, where the photographs, roentgenograms and her pathologic slides were thoroughly studied, as was the patient herself. The histologic slides were gone over by Dr. Shields Warren, who made a diagnosis of osteogenic sarcoma. A report from the Lahey Clinic stated in part: "While the x-rays of the lungs remain clear and we

Fig. 4.—Roentgenogram of right foot. Note sunburst rays proceeding from tumor.

Fig. 5.—Roentgenogram of left foot, taken for comparison.

are not able to clinically demonstrate evidence of metastases into the regional lymph nodes of the extremity, in view of the markedly malignant appearance of the tissue and in consideration of the x-ray findings, I believe that the best treatment would be amputation and that it should be performed just above the knee. This would offer the girl the best possible chance."

Accordingly, a low thigh amputation was done at the Rhode Island Hospital on April 19. The postoperative course was uneventful, the operative wound healing per primam, and the patient was discharged from the hospital on May 1. The pathologic report received from the Rhode Island Hospital was as follows: "The specimen consists of a leg, amputated at midthigh. There is an operative defect on the great toe, a portion of the middle phalanx of the great toe apparently having been previously removed. No evidence of tumor is seen grossly in either the proximal or the distal bone. No lymph nodes can be found in the popliteal space or elsewhere.

"The sections taken from the base of the previous operative site show, in addition to a moderately heavy acute polymorphonuclear leukocytic inflammatory reaction, an active granulation tissue response, and, related to the bone but situated generally in soft tissue, a few strands of anaplastic spindle cells with large irregular hypochromatic nuclei similar to those described as occurring in the previous specimen. At one point these tumor cells involved the bone and immediate marrow space. These focal areas of tumor are not in themselves completely diagnostic because of the possible effects of the previous operation and the associated inflammatory response, but there is sufficient similarity to the previous tumor to justify a definite diagnosis. *Diagnosis*: Amputated leg with remnants of osteogenic sarcoma in operative wound."

The stump of the thigh was dressed with ace bandages, and the patient began to use an artificial leg on July 17. Instructions were given her on its proper use. She was seen periodically after that, without any significant complaint until November 24, when she stated that she had begun to notice a small lump

Fig. 6.—Roentgenogram of right foot. There was considerable soft tissue reaction, and some areas of sclerotic bone were observed. Sunburst rays are visible, as in Figure 4.

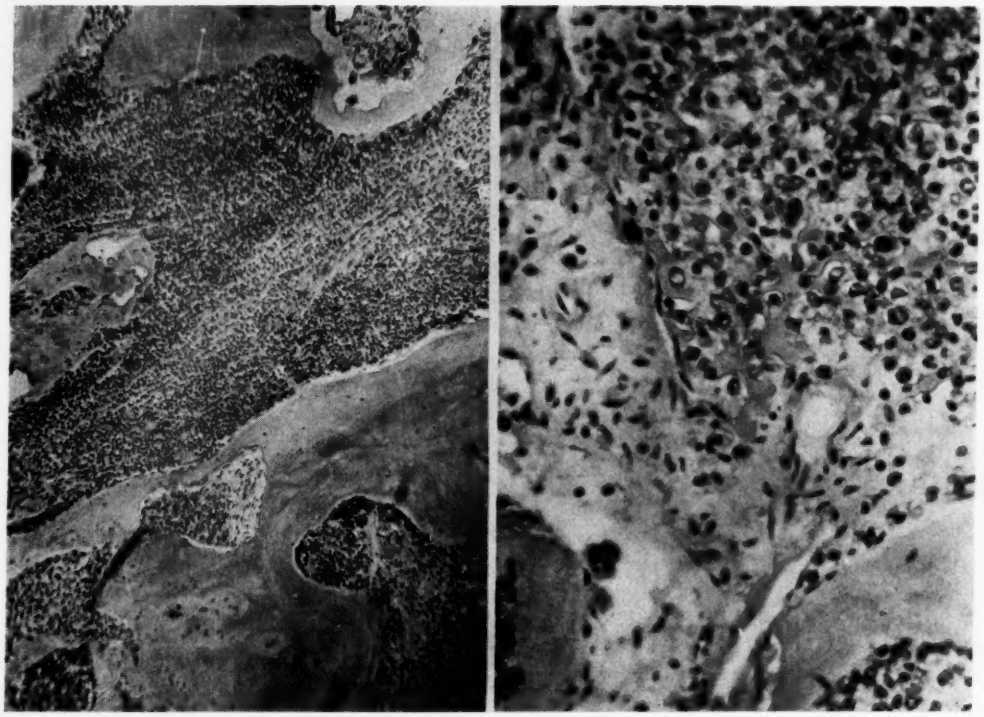

Fig. 7.—Low and high power photomicrographs of tumor (see text).

in the right groin. The lump seemed to be placed at about the middle of the groin and was approximately the size of a plum. The skin was freely movable over it. It was nonfluctuant but slightly tender. No other particular lymph glands could be palpated. Because of this the patient was admitted to the Miriam Hospital at Providence on December 3 and on December 4 underwent an operation for removal of the mass. At operation, the mass was removed and a search made for other glands, but none was found. The mass removed measured approximately 2.5 by 3 cm., appeared to be well defined and was easily removed by blunt dissection. The postoperative course was uneventful, the operative wound healing per primam. The patient was discharged from the hospital after only a few days, on December 8.

The report from the Institute of Pathology of the Rhode Island Hospital read in part as follows: "The specimen consists of a well-defined tumor mass measuring 2 by 3 cm. inside. It has already been sectioned through its midline. The cut surface is smooth, gray-white and glistening and has a finely lobulated edge. Scattered about the cut surface are areas of hemorrhage. The edges of the cut surface evert slightly.

"These are sections of a nodular mass of tissue whose configuration is consistent with a lymph node but which is completely replaced by masses of highly undifferentiated neoplastic cells with sparse, ill-defined cytoplasm and prominent hypochromatic nuclei with coarse chromatin reticular network. There are a few areas of eosinophilic hyaline material that bears at least a superficial resemblance to the osteoid matrix occurring in some areas. This picture is not unlike the histologic picture of the original tumor. *Diagnosis*: Osteogenic sarcoma, metastatic, of an inguinal tymph node." (See Figure 8.)

The patient resumed the wearing of her artificial limb after complete closure of the operative wound and has continued to wear

Fig. 8.—Photomicrograph of tumor sectioned through midline.

it since then. She has had periodic checkup examinations, no glands in the groin being present at any time. Periodic roentgenograms of the chest have also been taken, the last one in December 1957, none of which reveals any evidence of metastatic lesions.

At the time of writing, the patient is 23 years of age, is working daily and is enjoying a fairly normal life. In addition to getting about and going to work, she is enjoying the life of an average 23-year-old girl, including dancing.

SUMMARY

A case of primary osteogenic sarcoma occurring in a rather rare location is reported. Primary osteogenic sarcoma rarely occurs in the foot and much more rarely in the toes. Although the author has certain knowledge that the case here reported represents an eight-year survival, from the history given it is quite likely that the lesion started about eleven years ago.

The case is unusually rare, not only because it involves a primary osteogenic sarcoma of the toe with an eight-year survival but because the patient is living and well seven years after a proved metastatic lesion from the primary tumor was removed.

RESUMEN

Se cita un caso de sarcoma osteogénico primitivo de localización poco frecuente. Dicho sarcoma raramente se presenta en el pié y menos aún en los dedos de éste. Aunque el autor sabe con seguridad que el caso citado representa una supervivencia de 8 años, se deduce de la histpria que el caso debió iniciarse hace unos 11 años.

Lo extraordinario del caso deriva no solo de una supervivencia de 8 años a partir de un sarcoma osteogénico primario de un dedo de un pie, sino de que continúa sano después de que hace 7 años se le extirpó una evidente lesión metastática del tumor primitivo.

ZUSAMMENFASSUNG

Es wird über einen Fall von osteogenem Sarkom an einer ziemlich ungewöhnlichen Stelle berichtet. Primäre osteogene Sarkome treten nur selten am Fuss und noch seltener an den Zehen auf. Der Verfasser weiss mit Sicherheit, dass im vorliegenden Falle die Krankheit bereits acht Jahre zurückliegt; nach der Anamnese ist es jedoch wahrscheinlich, dass sie schon vor etwa elf Jahren begann.

Der Fall ist ausserordentlich ungewöhnlich, nicht nur weil es sich um einer Kranken handelt, der mit einem primären osteogenen Sarkom der Zehe acht Jahre überlebt hat, sondern auch weil sich der Patient am Leben und wohl befindet sieben Jahre nach der Entfernung einer nachgewiesenen Metastase des Primärtumors.

RIASSUNTO

Viene riferito un caso di sarcoma osseo primitivo in sede rara. Questo tumore si manifesta molto raramente nel piede, specie nelle dita. Nel paziente, che sopravvive da otto anni, l'Autore ha buoni elementi per presumere che la malattia sia cominciata undici anni prima. La rarità del caso è così legata non solo alla sede del tumore (dita del piede), ma anche alla lunga sopravvivenza e al fatto che il paziente continua a star bene dopo che gli è stata anche asportata una metastasi.

RÉSUMÉ

Le sarcome primaire osteogenique du pied est rare. L'auteur présente un cas de sarcome primaire osteogenique dans une situation peu commun, le grand doigt du pied. La lesion original, selon toute apparence, existé pendant onze ans.

Le cas est extraordinaire non seulement á cause de la lésion et la survie pour huit ans mais aussi á cause de la survie pour sept ans après la résection d'une metastase de la lésion primaire.

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According to insurance statistics, motor accidents in the United States during the year 1957 resulted in 38,700 deaths and 2,525,000 injuries. Speeding was blamed for 13,200 deaths on American highways. Of those who perished as a result of traffic disasters, 7,500 were pedestrians; some of these were blameless, but 2,600 of the fatalities were due to "jaywalking." Week-ends are obviously the most dangerous times for highway driving—more than 55 per cent of the fatal accidents occurred on Friday, Saturday or Sunday. Nearly 27 per cent of the drivers involved were below the age of 25. Passenger cars were involved in more than 78 per cent of all fatal accidents.

It is notable that at least 95 per cent of these cars were apparently in good condition at the time of the accident. Although the death toll for 1957 was 1,300 less than that for 1956, the picture is still appalling. Speeding, "cutting in," failure to signal or signaling incorrectly, carelessness at crossings, driving without having the right of way and disregard of the driving of others—all avoidable—continue to make incredible inroads on life and limb.

Poor Posture: the Result of Undiagnosed Poliomyelitis

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THE statement that poor posture is a bad habit has been used repeatedly in the literature, on posters and by orthopedic surgeons and physical therapists. The purpose of this paper is to emphasize and attempt to establish the fact that poor posture is not a bad habit, because poor posture is not a habit.

Meticulous, methodical and mentally alert children may have poor posture. Lazy, poorly adjusted, mentally lethargic children, conversely, may have excellent posture.

I am convinced that poor posture is due to muscle tightness and mild muscle weakness. It is secondary to a nonparalytic or extremely mild paralytic poliomyelitis infection. The percentage of paralysis in cases in which poliomyelitis is diagnosed is extremely small. The disease may even be, up to the present time, universal and the diagnosis, therefore, made in relatively few cases. The cases of nonparalytic poliomyelitis may well fall into the category of contagious diseases, such as the exanthems or pertussis. The disease unfortunately produces no rash, no characteristic cough and frequently no positive clear-cut diagnostic signs except for positive results from an examination of the spinal fluid. Routine spinal taps are not used for headache, sore throat, vomiting, or painful or mild stiffness of the neck, back or extremities, and these are the only signs and symptoms of nonparalytic poliomyelitis. The condition is erroneously diagnosed again and again, therefore, as a summer cold or grippe.

I am further convinced that there are degrees of severity in the muscle tightness and the resultant muscle shortening associated with nonparalytic poliomyelitis, as there are degrees of muscle weakness and paralysis in cases of paralytic poliomyelitis.

Incidence of Nonparalytic Poliomyelitis.—During 1945 and 1946 an attempt was made to determine the incidence of poliomyelitis infection in the Chicago area by direct virus isolations.[1] These studies included investigation of contacts and noncontacts of infected persons. From the data obtained, it was calculated that most children in Chicago had probably had poliomyelitis once by the fourth birthday, and 75 per cent perhaps twice by the sixth birthday, either from different strains or from reinfection.

The extent to which poliomyelitis in children is contagious has been reported by Casey and his co-workers.[2] They noted that poliomyelitis was contagious in about 90 per cent of children from 1½ to 3½ years of age.

From these calculations it appeared to Casey and his colleagues that, on the average, more than 100,000 and up to 125,000 cases of poliomyelitis occur in Chicago each year; that is to say, 3 to 4 per cent of the total population are affected. In their opinion, paralysis associated with poliomyelitis, representing a condition occurring less than once in each 200 cases, may be a reinfection in

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sensitized persons or in persons with poor natural or acquired resistance.

Sherman, in a review of the medical literature, has emphasized that in 72.8 per cent of cases of acute poliomyelitis there is no residual weakness, or such slight weakness that it was barely detectable.[3]

Moskowitz and Kaplan[4] expressed the opinion that with the advent of passive immunization with gamma globulin an even greater percentage of cases in which the disease is abortive and nonparalytic may be anticipated. In their follow-up study of patients with nonparalytic poliomyelitis (who, at the time of discharge from the hospital, showed no muscular weakness) in the outpatient department a surprising number showed various sequelae. These sequelae were residual spasm; increased fatigability and emotional disturbances.

Relation Between Muscle Shortening and Poliomyelitis.—It is agreed that poliomyelitis is a generalized disease. It does not affect single muscles or groups of muscles, but does affect every striated muscle. It may cause paralysis in varying degrees or muscle tightness in all striated muscles. This muscle tightness is not briefly temporary but persists for years.

The newborn is an extremely flexible subject. There is no indication of muscle tightness in the normal newborn. Every joint of the infant can be carried through a complete range of motion. The examiner will not be able to demonstrate spasm or shortening of hamstrings or back muscles, tight heel cords or pes cavus. The child 1, 2 or 3 years of age has excellent posture, and then frequently something happens.

In my opinion, what happens is nondiagnosed, nonparalytic poliomyelitis. If the muscle tightness is moderate or severe, the posture of the growing child gradually and progressively becomes impaired. Normal physiologic length of muscle is necessary for good posture.

Demonstration of Muscle Shortening.—The muscle tightness can be scientifically demonstrated by electromyographic study. The application of electrodes to tight muscles will send an abnormal bombardment of impulses across an oscillogram. These impulses, arising from the neuromuscular juncture with the subject at rest, will appear as a decidedly irregular line. With the normal person the oscillogram should appear as a fiat line or as what is frequently described as "electrically silent." In other words, normally a resting muscle should have no measurable action potentials (Sherrington's law).

A comprehensive study with use of the electromyograph was done by Dr. Nicholas Ransohoff and myself. Measurable resting action potentials were repeatedly demonstrated in all cases of poliomyelitis, in children with poor posture and in adults with deformities due to persistent muscle spasm or shortening.

Electromyographic studies by many workers have demonstrated that muscle spasm in the presence of acute anterior poliomyelitis is a more extensive sign than are muscle weakness and paralysis. Schwartz, Bonman, and Smith[5] have emphasized the fact that spasticity is a generalized phenomenon in the early stages of infantile paralysis. By their studies, they have demonstrated the general systemic effect of this disease.

Clinically, Robert Bingham[6] reported a large series of cases of chronic nonprogressive muscle dystrophy, characterized by general weakness and contractures of all skeletal muscles. In the medical histories of his series of patients there was so high an incidence of acute anterior poliomyelitis as to lead the author to conclude that poliomyelitis is the only cause of this syndrome, which he called "muscle fibrodystrophy."

Effect of Muscle Shortening on Posture.—Posture is affected by muscle shortening in a number of different ways:

1. Tight neck extensors cause the head to droop forward.

2. Tight pectoral muscles and teres minor cause cupping of the shoulders and roundness of the dorsal portion of the spine.

3. Tight scapula elevators, combined with weakness of the serratus magnus, cause flaring of the scapula.

4. Tight intercostals will produce partial "frozen chest." The normal excursion of ribs is decreased.

5. Tight hamstrings will produce a forward tilting of the pelvis, producing swayback. If the abdominal muscles are weak, the deformity is greater.

6. Contracture and shortening of the sacrospinalis muscles will likewise increase lumbar lordosis and prominence, and frequently a mild rotation in the dorsal vertebrae, particularly between the sixth and the eleventh dorsal.

7. Pes cavus and pes planus are frequently due to shortening of the peroneal muscles or to contracture of the plantar fascia and short flexors of the feet.

8. Tight heel cords produce symptomatic flat feet and change the normal physiologic gait.

Furthermore, I am not convinced that the loss of flexibility is due to advancement in age. Many persons retain the same degree of flexibility throughout their lives.

Management of Muscle Shortening.—This muscle shortening is not under the voluntary control of a child. The child cannot improve posture by mental concentration. The posture, however, can be improved by restoring these muscles to their normal physiologic length.

To overcome increased muscular irritability and muscle shortening, Ransohoff, in 1945, as well as Paul, independently began the treatment of acute poliomyelitis by early stretching.

As described by Raisman and Schneiderman,[7] the stretching was designed to carry every joint through its complete range of motion and to stretch every muscle to its normal physiologic length. Stretching is continued until normal muscle length has been restored. A follow-up survey of 75 per cent of the patients, carried out two to six years later, revealed that stretching must be continued indefinitely; otherwise, tightness or shortening will return.

Effects of Poor Posture.—Those who assume that children will outgrow this type of posture entertain wishful expectations and, in addition, subject the child to many orthopedic sequelae. The tight cervical muscles and forward flexion of the neck produce further shortening and tightening of the trapezius and scalenus anticus muscles, which cause pain in the neck and irritation along the nerve roots. This frequently necessitates long periods of intensive orthopedic care.

Tight, short intercostals produce dorsal pain and possibly dorsum rotundum.

Tight paraspinal and hamstring muscles and weak abdominal muscles will produce postural backaches or chronic lumbosacral sprain. The pelvis is tilted forward; a shearing stress is placed on the lumbosacral joint. A plumb line dropped from the center of the third lumbar vertebra falls anterior to the promontory of the sacrum.

Tight heel cords, tight peronals and tight short flexors of the foot will produce either acquired pes planus or pes cavus, depending on the group of muscles involved.

The aforementioned instances, in my opinion, are only a few of the frequent examples of the end result in muscles that have lost their normal length.

CONCLUSION

Tightness of muscle structures, secondary to either paralytic or nonparalytic poliomyelitis, is the causative factor in (a) poor posture and (b) the development of many orthopedic symptoms and signs in later life. This condition can be treated by proper muscle stretching until the normal physiologic muscle length is restored.

SCHLUSSFOLGERUNGEN

Als Folge paralytischer oder nichtparalytischer Poliomyelitis auftretende Muskelsteifheit spielt eine ursächliche Rolle bei a) schlechter Körperhaltung und b) der Entwicklung vieler orthopädischer Symptome und Krankheitszeichen im späteren Leben.

Dieser Zustand lässt sich durch geeignete Streckung des Muskels bis zur Wiederherstellung seiner normalen physiologischen Länge behandeln.

CONCLUSIONS

Les contractures musculaires secondaires à une paralysie ou à une poliomyélite non paralytique peuvent provoquer: a) une attitude viciée, b) le développement de nombreux symptomes et signes orthopédiques tardifs.

Il est possible d'y remédier par une extension musculaire jusqu'à récupération de la longueur normale.

CONCLUSIONI

Le contratture muscolari secondarie a poliomielite con paralisi o senza sono la causa di posizioni viziate e di altri disturbi ortopedici secondari.

Esse possono venire corrette con un opportuno allungamento del muscolo fino alle sue dimensioni normali.

CONCLUSOES

As atrofias musculares secundarias ou não á poliomielite são fatores causais de: a- posição defeituosa e b- desenvolvimento de muitas condições anoma las futuramente, quer dependam ou não das formas paraliticas da molestia.

Estas afecções mu sculares podem ser tratadas pela reeducação até o nivel fisiologico normal.

CONCLUSIONES

Las contracturas musculares, secundarias a poliomelitis sí o on paralíticas, son causa (a) de deformidades y (b) de la aparición de muchos síntomas ortopédicos en la vejez.

Tales trastornos pueden ser tratados mediante la extensión muscular adecuada hasta que se recupere la longitud muscular fisiológica normal.

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Otorhinolaryngologic Surgery

Lesions of the Oral Cavity

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LESIONS of the oral cavity can be divided into several categories for the purposes of discussion, those of congenital and developmental causation, traumatic lesions, inflammatory reactions, neoplasms, and lesions resulting from local reactions to systemic disease.

The congenital and developmental lesions are those which result from disturbances in the normal development of the oral cavity in the embryo and also later, during the period of growth. Oral clefts result from lack of fusion of the various elements making up the oral cavity. Abnormalities may also develop in localized tissue. Hemangiomas and lymphangiomas result from lack of normal development of the vascular structures, and they may occur as protruding lesions on the oral mucosa. They may contain pure lymphatic material only, blood only or a combination of the two. The lesion of lymphangioma is cystic and translucent. The cystic areas can be emptied into the surrounding lymphatics, only to fill up slowly after pressure is removed. Hemangioma is a result of enlargement of the blood vessels in a localized area, and its appearance and character depend upon the relation of the lesion to the oral mucosa and to the size of the vessels. These vary from the capillary type in which the mucosa is only reddened without elevation, to the type in which the oral cavity is distorted by a large bluish mass of dilated blood vessels.

The treatment of lymphangiomas and hemangiomas is aimed at destroying the feeder vessels and the main draining vessel. This can be done by excision of the vessels with the involved mucosa and underlying tissue, or by producing sclerosis of the dilated vessels. Occasionally a hemangioma develops after a traumatic injury to the soft tissue. With this type, localized areas of calcification usually develop.

Cysts may also be either congenital or developmental anomalies. They are produced by the formation and eruption of teeth and can be divided into those which protrude from the oral mucosa and those which produce destruction of bone without being visible clinically. The treatment of cysts is aimed at eliminating the epithelial cavity, either by marsupialization or by enucleation.

It should be stressed that the possibility of malignant changes in cysts exists, in spite of the fact that some authorities do not agree. Since the epithelial lining of cysts of the jaw has the same embryonic origin as the epithelial lining of the oral cavity, and since it is known that malignant changes do take place in the oral epithelium, it is only logical to infer that they may also take place in cysts.

The mucosal lining of the oral cavity is subject to constant trauma, which can give rise to oral lesions. Probably the most

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common trauma to the oral mucosa, including the tongue, is produced by the pinching or cutting of the tissues by the teeth during eating or talking. Other injuries include mechanical, chemical and thermal injuries produced by such things as rough dental appliances or the ingestion of rough foods, of foods to which the patient is allergic or of extremely hot or extremely cold foods. Chemical or thermal changes are commonly caused by such substances as tobacco, aspirin or other irritating foreign materials. They may also be brought about by exposure to radiation.

The response of the oral mucosa to trauma varies greatly in different cases. Injuries to the oral cavity may cause a change in any of the various tissues in the irritated area. Some lesions that may result from irritation or trauma are traumatic ulcer, fibroma, hyperkeratosis and leucoplakia, all of which will be discussed later. The mucous gland ducts may also be blocked, forming mucoceles or ranules. Injuries to the mucosa and vessels may produce pyogenic granulomas, and injuries to nerves may produce neuromas. Tori or exostoses may result from irritation or injuries to the bone.

Inflammatory reactions in the oral mucosa are the response of the tissues to injury. One such type of injury is invasion of the mucosa by bacteria. The extent of the inflammatory reaction is determined by the type of invading organism and the degree of success of the invasion. There is a coordination between the virulence of the invading organism and the resistance of the host. The reactions vary from localized redness and irritation of the oral mucosa to necrotic destruction of tissue by the Vincent organism. When the infection invades a patient with low resistance, massive necrosis may be produced. This may result in gangrenous stomatitis in adults, as with infection invading a patient with cardiac disease or as with noma in a child.

Several inflammatory reactions present such similar clinical appearances that history and laboratory tests are necessary for a definite diagnosis. Erythema multiforme, which may result from some specific allergic reaction, is often mistaken for various fungus or bacterial infections. Tuberculosis, syphilis and the fungi are often confused clinically. Tuberculous ulceration of the oral mucosa is common in patients with pulmonary tuberculosis who undergo mucosal injuries and in whom a secondary tuberculosis infection is superimposed. Lupus erythematosus may appear on the lip and oral mucosa. Syphilitic lesions may occur in the oral mucosa, whether they are primary, secondary or tertiary. Pemphigus commonly begins with oral lesions before the lesions appear on the skin. It usually appears as vesicles and breaks down to form progressive painful ulcers.

Neoplasms of the oral cavity make up the largest class of oral lesions. They may be divided into benign and malignant, as well as into groups depending on their tissue origin.

The mucosal lining of the oral cavity is made up of stratified squamous epithelium lying on a fibrous submucosa, beneath which are numerous mucous glands. The lining is subject to various neoplastic changes. One type of benign lesion of the epithelium is the epithelial papilloma, a treelike growth in which there is an outgrowth of the epithelial cells but the basement membrane remains intact. The epithelium may also respond to irritation by merely piling up, as in hyperkeratosis, or by piling up with inflammatory changes, as in leukoplakia and lichen planus.

The basement membrane of the oral mucosa may be disturbed as a result of irritation, as in leukoplakia. In this lesion there is a piling up of epithelium and a submucosal inflammatory reaction. Leuko-

plakia is a progressive and reversible lesion. If the irritation is maintained, the epithelial reactions may progress to the point where the cell divisions and growth get out of control and the lesion becomes a squamous cell carcinoma. If the irritation is removed before the malignant change has begun, however, the lesion will reverse itself and the epithelium will return to normal.

Since not all of the factors involved in the production of malignant growth of epithelial cells are known, one cannot predict the final outcome of lesions that result from irritations. It is also well to keep in mind that there are irritations other than mechanical that may produce malignant changes.

Tumors of the gingiva, or epuli, are classified according to their predominant tissue elements. They are gingival hemangiomas, giant cell tumors, fibrous and epithelial tumors. They result from an overgrowth of tissue as a response to stimulation. Excessive fibrous growth may occur in patients to whom dilantin sodium is administered. Giant cell tumors may form in patients with hyperparathyroidism. Pyogenic granuloma may occur when there are infections of the gingiva. Pregnancy tumors or endocrine tumors may result from endocrine imbalances.

The mucous glands lining the oral cavity are subject to neoplastic growths that result in any of the tumors known to appear in the major salivary glands. They present as a swelling beneath the mucous membrane and do not produce a break in the mucosa until they become extremely large.

Sarcoma of the jaw usually begins as a localized swelling in the submucosal tissue and many times is mistaken clinically and histopathologically for benign fibroma. It continues to recur, however, after many removals, and finally spreads by metastases.

Some unusual lesions of the oral cavity are multiple myeloma, Kaposi sarcoma, malignant lymphoma, melanoma and neurofibromatosis.

Several lesions appearing in the oral cavity are the result of systemic diseases. The contagious diseases may produce changes in the oral mucosa, one example being Kaplich spots, which appear on the buccal mucosa before the cutaneous rash appears in measles. Vitamin deficiencies may produce oral lesions, such as bleeding, red gingiva (Vitamin C deficiency) and scaly ulcerations at the corners of the mouth (Vitamin B deficiency). Purpura and leukemia may cause bleeding gums, and pernicious anemia causes the condition known as smooth tongue.

Occasionally a normal structure in the oral cavity is mistaken for a pathologic condition. Sebaceous glands or Fordyce spots are often mistaken for pathologic lesions. The papillae at the opening of Stensen's duct are many times mistaken for tumor growths. The rugae of the palate have also been mistaken for tumors.

SUMMARY

Lesions of the oral cavity can be divided into those of congenital and developmental etiology, traumatic lesions, inflammatory reactions, neoplasms, and lesions resulting from local reactions to systemic disease.

The treatment of congenital lymphangiomas and hemangiomas is directed toward the destruction of feeder vessels and the main draining vessel either by excision or producing sclerosis. Congenital cysts of the jaw may become malignant, since their epithelial lining has the same embryonic origin as the epithelial lining of the oral cavity, and the latter may undergo malignant changes.

The response of the oral mucosa to trauma varies greatly and may result in such lesions as traumatic ulcer, fibroma, hyper-

keratosis, leukoplakia or pyogenic granuloma. Other response to trauma are mucoceles, neuromas and exostoses. Many inflammatory reactions of the oral mucosa must be diagnosed by laboratory tests, since the clinical appearances are similar.

Neoplasms of the oral cavity may occur in the epithelium, as in epithelial papilloma, hyperkeratosis, leukoplakia and lichen planus. Leukoplakia may progress and become squamous cell carcinoma, or, if the irritation is removed in time, may revert to normal tissue. Some tumors of the gingiva are gingival hemangiomas, giant cell tumors, which occur in patients with hyperparathyroidism, and fibrous and epithelial tumors. Other neoplasms are first, those which originate in the mucous glands, and second, sarcomas of the jaw, which can be mistaken for benign fibromas except that they continue to recur after removal and finally metastasize.

Several oral lesions are the result of systemic diseases, such as Kaplich spots in measles, bleeding gingiva in Vitamin C deficiency, and scaly ulcerations at the corners of the mouth in Vitamin B deficiency. Purpura and leukemia may cause bleeding gums.

Occasionally normal structures, such as sebaceous glands or Fordyce's spots, the papilla at the opening of Stensen's duct or the palatal rugae, are mistaken for tumors.

CONCLUSIONS

Lesions of the oral cavity can be divided into those (a) congenital and developmental, (b) traumatic, (c) inflammatory, (d) neoplastic and (e) resulting from local reactions to systemic disease.

The treatment of congenital lymphangiomas and hemangiomas is directed toward the destruction of feeder vessels and the main draining vessel, either by excision or by the production of sclerosis.

Congenital cysts of the jaw may become malignant, since their epithelial lining is of the same embryonic origin as the epithelial lining of the oral cavity, and the latter can undergo malignant change.

The response of the oral mucosa to trauma varies greatly and may result in such lesions as traumatic ulcer, fibroma, hyperkeratosis, leukoplakia or pyogenic granuloma. Other responses to trauma in the oral cavity are mucoceles, neuromas and exostoses.

Many inflammatory reactions of the oral mucosa must be diagnosed by laboratory tests, since the clinical appearances are similar.

Neoplasms of the oral cavity may occur in the epithelium, as with epithelial papilloma, hyperkeratosis, leukoplakia and lichen planus.

Leukoplakia may progress and become squamous cell carcinoma, or, if the irritation is removed in time, may revert to normal tissue.

Some tumors of the gingiva are gingival hemangioma, giant cell tumor, which occurs in patients with hyperparathyroidism, and fibrous and epithelial tumors.

Other neoplasms are those tumors originating in the mucous glands and sarcomas of the jaw, which can be mistaken for benign fibromas except that they continue to recur after removal and finally metastasize.

Several lesions are caused by systemic diseases. Kaplich spots in measles, bleeding gingiva in cases of Vitamin C deficiency, and scaly ulcerations at the corners of the mouth in cases of Vitamin B deficiency. Purpura and leukemia may cause bleeding of the gums.

Occasionally normal structures, such as sebaceous glands or Fordyce's spots, the papilla at the opening of Stensen's duct or the rugae, are mistaken for tumors.

CONCLUSIONI

Le lesioni della cavità orale possono distinguersi in: (1) con genite e di svi-

luppo; (2) traumatiche; (3) infiammatorie; (4) neoplastiche; (5) da manifestazione locale di malattie sistemiche.

La cura degli emangiomi e dei linfangiomi congeniti consiste nella distruzione dei vasi nutritizi e di quelli di scarico, che si può ottenere sia con l'escisione che con la sclerosi.

Le cisti congenite della mandibola possono divenire maligne poichè il loro epitelio di rivestimento è identico a quello che riveste la cavità orale.

La mucosa orale reagisce ai traumi in vario modo, sia producendo ulcere traumatiche, sia fibromi, ipercheratosi, leucoplachie o granulomi infetti. Più raramente producendo mucoceli, neuromi ed esostosi.

Molte lesioni infiammatorie della mucosa orale devono essere diagnosticate con l'aiuto del laboratorio poichè le loro manifestazioni cliniche sono molto simili.

Molti tumori del cavo orale possono prodursi sull'epitelio come pure su papillomi, ipercheratosi leucoplachie, lichen planus.

La leucoplachia può evolvere e dare un carcinoma pavimentoso, mentre invece, se asportata in tempo, può guarire completamente. I tumori delle gengivo possono essere emangiomi, tumori a cellule giganti (in malati con iperparatiroidismo) e tumori fibro-epiteliali Altri tumori sono quelli che si originano dalle ghiandole mucose e i sarcomi della mandibola; questi ultimi possono essere confusi con fibromi benigni se non fosse che recidivano continuamente dopo asportazione, e infine metastatizzano.

Le affezini legate alle malattie sistemiche sono: le macchie di Köplich nel morbillo, le emorragie gengivali nelle deficienze di vitamina C, nella porpora e nella leucemia. In qualche caso strutture normali, come ghiandole sebacee, la papilla situata allo sbocco del dotto di Stenone o altre pieghe della mucosa, possono essere scambiate per tumori.

CONCLUSION

Clasificación de las lesiones de la cavidad oral:

a) malformaciones congénitas o del desarrollo.

b) Traumatismos.

c) Inflamaciones.

d) neoplasias.

e) Lesiones locales correspondientes a enfermedad generalizada.

El tratamiento de los linfangiomas y hemangiomas debe — orientarse hacia la destrucción de los vasos ramificados y del tronco principal de drenaje, bien por escisión o por producción de esclerosis.

Los quistes congénitos de la mandíbula pueden malignizarse, puesto que el epitelio que los tapiza tiene el mismo origen embriónico que el revestimento epitelial de la cavidad oral y éste puede sufrir un proceso de malignización.

La respuesta de la mucosa bucal a los traumatismos toma diversas formas tales como la úlcera trumática, el fibroma, la hiperqueratosis, la leucoplasia y los granulomas piógenos otros tipos de lesiòn por traumatismo son los mucoceles, neuromas y exóstosis.

Muchas reacciones inflamatorias de la mucosa bucal tienen la misma forma clínica, y por eso el diagnóstico diferencial debe hacerse en estos casos en el laboratorio.

Las neoplasias de la boca pueden originarse en el epitelio, como el papiloma epitelial, la hiperqueratosis, la leucoplasia y el liquen plano.

La leucoplasia puede progresar y convertirse en un carcinoma de células planas, o bien, si se suprime el factor de irritación, puede regresar a un epitelio normal.

Algunos tumores de las encías son: el hemangioma gingival, el tumor de células gigantes (que aparecen en sujetos que padecen hiperparatiroidismo), y tomores fibro-epiteliales.

Hay otras neoplasias, tales como los tumores que se originan en las glándulas de la mucosa, y los sarcomas de la mandíbula que pueden confundirse con los fibromas benignos, pero que recidivan después de su exérisis y dan metástasis.

Las lesiones bucales que representan la localización de un proceso general corresponden a diversas enfermedades: los puntos de Kaplich en el sarampión, las gingivorragias de las conmisuras labiales en la hipervitaminosis B.

La purpura y la leucemia pueden producir hemorragias en las encías.

Algunas veces pueden tomarse como tumores estructuras que son perfectamente normales, tales como las glándulas sebáceas, los puntos de Fordyce, la desembocadura del conducto de Stensne.

CONCLUSAO

As lesões da cavidade oral podem ser divididas: a) congenitas; b) traumaticas; c) inflamatorias; d) neoplásicas; e) resultantes de reações locais de doenças gerais.

O tratamento dos linfangiomas e hemangiomas congenitos deve ser a destruição dos vasos por excisão ou por esclerose.

Os cistos congenitos da mandíbula podem se tornar malignos pois que o seu revestimento epitelial é de origem embriogenica identica a da cavidade bucal.

A resposta da mucosa da boca aos traumatismos varia grandemente e pode resultar em ulceras traumaticas, fibroma, kperceratose, leucoplasia ou granulomas piogenicos. Alem disso pode haver mucoceles, neuromas e exostoses.

Muitas reações inflamatorias da mucosa podem ser diagnosticadas pelo laboratorio quando as aparencias clinicas são semelhantes. Os neoplasmas podem ser situados no epitelio, sob as formas de papiloma epitelial, hiperceratore, leukoplasia e lichen planus. A evolução da leucoplasia pode chegar ao baso-celular ou, se a irritação for removida á tempo pode voltar ao tecido normal. Alguns tumores da gengiva são hemangiomas, tumor de celulas gigantes que ocorrem em doentes com hiperparatireoidismo e fibromas epiteliais.

Outros neoplasmas são os que têm origem nas glandulas mucosas e os sarcomas da mandíbula que podem ser erroneamente tomados por fibromas benignos exceto quando recidivam e finalmente dão metastases.

Muitas lesões são causadas por lesões sistêmicas: macula de Kaplich no sarampo, sangramento no curso de hipovitaminose C e pequenas ulcerações no fundo da boca por deficiência de vitamina B. A purpura e a leucemia podem fazar sangrar as gengivas.

Ocasionalmente estruturas normais com as glandulas sebaceas ou pontos de Fordyce, a papila do orificio do canal de Stenon são tomados por tumores.

SCHLUSSFOLGERUNG

Die Erkrankungen der Mundhöhle lassen sich in folgende Gruppen einteilen:

a) angeborene Erkrankungen und Entwicklungsstörungen,

b) traumatische Erkrankungen,

c) entzündliche Erkrankungen,

d) Neubildungen und

e) Erkrankungen als Folge örtlicher Reaktionen auf Systemerkrankungen.

Die Behandlung angeborener Lymphangiome und Hämangiome richtet sich auf die Zerstörung der zuführenden Gefässe und des abführenden Hauptgefässes entweder durch Resektion oder durch Sklerosierung.

Angeborene Zysten des Kiefers können bösartig werden, da ihr auskleidendes Epithel denselben embroyologischen Ursprung hat wie das Mundhöhlenepithel, das bösartige Veränderungen produzieren kann.

Die Reaktion der Mundschleimhaut auf Verletzungen kann sehr verschieden sein und zu traumatischen Geschwüren, zur Entstehung von Fibromen, zu Hyperkeratose, Leukoplakie oder pyogenen Granulomen führen. Andere Folgeerscheinungen von Verletzungen innerhalb der Mundhöhle sind Mukozelen, Neurome und Exostosen.

Viele entzündliche Reaktionen der Mundschleimhaut erfordern zu ihrer Diagnostizierung Laboratoriumsuntersuchungen, da die klinischen Erscheinungen einander sehr ähnlich sind.

Neubildungen der Mundhöhle können im Epithel auftreten wie beim epithelialen Papillom, bei der Hyperkeratose, der Leukoplakie und beim Lichen planus.

Die Leukoplakie kann fortschreiten und sich zum Schuppenzellkrebs entwickeln oder, wenn der Reiz rechtzeitig entfernt wird, sich zu normalem Gewebe zurückbilden.

Zu den Geschwülsten des Zahnfleischs gehören die Zahnfleischhämangiome, die Riesenzellgeschwülste, die bei Kranken mit Überfunktion der Nebenschilddrüse auftreten, und fibröse Epithelialtumoren.

Andere Geschwülste sind die, die aus den Schleimdrüsen entstehen, und die Kiefersarkome, die mit gutartigen Fibromen verwechselt werden können; sie treten aber nach der Resektion immer wieder auf und metastasieren schliesslich.

Einige Erkrankungen entstehen durch systematische Leiden: Koplikssche Flecke bei Masern, Zahnfleischblutungen bei Vitamin-C-Mangel und schuppige Geschwüre in den Mundwinkeln bei Vitamin-B-Mangel. Purpura und Leukämie können Zahnfleischblutungen hervorrufen.

Gelegentlich werden normale Gebilde wie Talgdrüsen oder Fordycesche Flecke, die Papille oder die Schleimhautfalten an der Öffnung des Ductus parotideus mit Geschwülsten verwechselt.

CONCLUSIONS

Les lésions de la cavité buccale peuvent être classées en: a) congénitales; b) traumatiques; c) inflammatoires; d) néoplasiques; e) réactions systématiques.

Le traitement des lymphangiomes et hémangiomes congénitaux a pour but de détruire les vaisseaux alimentés et le vaisseau évacuateur principal, soit par excision soit par la création d'une sclérose.

Les kystes congénitaux de la mâchoire peuvent dégénérer étant donné que leur revêtement épithélial a la même origine embryonnaire que celui de la cavité buccale qui est susceptible de présenter des modifications malignes.

Les réactions aux traumatismes de la muqueuse buccale varient beaucoup et peuvent provoquer des ulcères, des fibromes, de l'hyperkératose, de la leucoplasie ou des granulomes pyogènes, ainsi que des mucocèles, des neuromes et des exostoses.

Le diagnostic de nombreuses réactions inflammatoires de la muqueuse buccale exige des examens de laboratoire, car elles présentent souvent un aspect non différencié.

Les néoplasmes peuvent être localisés dans l'épithélium (papillome épithélial, hyperkératose, leucoplasie et lichen plan).

La leucoplasie peut évoluer en carcinome à cellules pavimenteuses, mais elle peut aussi disparaître si l'irritation est supprimée à temps.

Parmi les tumeurs de la gencive on distingue: l'hémangiome gingival, la tumeur à cellules géantes (hyperthyroïdisme) et les tumeurs épithéliales fibreuses.

Il faut noter aussi les tumeurs dans les glandes muqueuses, et les sarcomes de la mâchoire, qui peuvent être confondus avec des fibromes bénins, sauf par leur caractère récidivant après extirpation et leurs métastases terminales.

De nombreuses lésions sont dues à des affections systématiques taches de Keplich (rougeole), saignement des gencives

(déficience en vitamines C), ulcérations commissurales (déficience en vitamines B). Le purpura et la leucémie peuvent provoquer des saignements des gencives.

Il peut arriver que des glandes sébacées, des taches de Fordyce, ou une papille à l'entrée du canal de Stensen soient confondues avec des tumeurs.

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Nasal Atrophy, Atrophic Rhinitis, Ozena: Medical and Surgical Treatment

Repair of Septal Perforations

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ATROPHIC rhinitis is a chronic degenerative inflammatory disease of the nasal mucosa and the underlying and neighboring tissues, anatomically characterized chiefly by progressive and pronounced atrophy of any or all of the elements of the nasal and paranasal structures.

If to this is added fetor (offensive odor) and the formation of hard clinging crusts, the condition is referred to as *rhinitis atrophicans cum foetore*, or *ozena*.

Neither of these clinical entities, however, originates as such. Both are the final stages of a series of pathologic changes that may have started long before and in a small way in one or more limited areas. These changes are characterized by inadequate blood supply and isolated spots of beginning or further developed atrophy of one or more mucosal structures. Together, they are referred to clinically as *early nasal atrophy*.

The purposes of this paper are as follows:

1. To call attention to the prevalence of early nasal atrophy and the great importance of its causes, diagnosis and treatment.

2. To mention the active interest and investigations in the medical treatment of these diseases now stimulated by the availability of corticosteroids, antibiotics, vitamins and vasodilator drugs.

3. To show the progress that is being made in the "nasal cavity narrowing" operations based on an expanding understanding of nasal function rather than on knowledge of structure alone.

4. To present the thesis that multiple operations are often necessary and to describe an operative technic that permits and even simplifies the performance of many "repeat" surgical interventions.

5. To demonstrate that a long-term therapeutic program of multiple operations, together with hormone, steroid, antibiotic and other drug therapy and a general supportive and hygienic regimen, can rehabilitate even patients with extreme involvement in these crippling and disabling diseases, restoring social status and ameliorating psychic disturbances.

Despite the fact that many rhinologists today see few patients in the terminal stages of atrophic rhinitis and ozena, there has been in recent years a resurgence of interest in these degenerative diseases. In the last five years more than one hundred excellent scientific contributions on this subject have appeared in the literature. These, added to the more than three hundred titles listed in the previous twenty years, give abundant evidence of the vital interest still extant in all parts of the world. In the main, the reports are concerned with the medical and sur-

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gical aspects of treatment of the atrophic disease.

Etiologic and Pathologic Considerations.—The question of the cause of atrophic rhinitis is a problem burdened with a multiplicity of theories and a variety of facts. Speculations regarding causation have included consideration of such factors as heredity, syphilis, chronic nasal inflammation, trauma, acute exanthemas with trophoneurosis, diphtheria, cholesterol imbalance, avitaminosis, endocrine and hormonal disturbances, metabolic diseases, allergy and congenital factors.

Many excellent bacteriologic studies have been made and are uniformly accepted as a basis for at least some portion of the treatment. The Klebsiella bacillus, the Perez bacillus, Proteus aeruginosa, Bacillus pyocyaneus, Proteus vulgaris, Escherichia coli and other organisms have been identified in the flora and resolutely attacked. Reports of such treatment from reliable sources, however, are in great conflict.

One etiologic factor that has not been given too much emphasis is the participation of the nerves and ganglia (sphenopalatine) in nasal inflammations produced by such prevalent conditions as the acute exanthems, severe infections at the upper part of the respiratory tract and the common cold. The peripheral neuritis caused by diphtheria and resulting in palatal paralysis was a familiar clinical entity two generations ago. In the countries around the Mediterranean Sea, where sharp decrease in the incidence of measles, scarlet fever and diphtheria has been noted, there is also a sharp decrease in the occurrence of ozena, even though other causative factors, such as poor nutrition and bad living conditions, have remained comparable. Diseases of the upper part of the respiratory tract, however, are still rampant, and in spite of modern therapeutic methods the mechanisms for profound impairment of the nasal mucosa are still present, although frequently in a much lesser degree.

Explanation for the usual neurovascular changes is conceivably as follows:

Higbee,[1] writing of the clinical interest in the sphenopalatine ganglion, pointed out that it is "(1) wholly associated with the parasympathetic nervous system and (2) relays vasodilator and secretory impulses . . . to the mucosa of the upper respiratory tract. (3) The parasympathetic nervous system has a low threshold for stimulation. Vasodilator and secretory fibres . . . are continuously making adjustments to atmospheric and constitutional states in an effort to maintain a normal nasal membrane."

The peripheral nerves and ganglia of the autonomic nervous system observable in the nose are easily accessible to infection and trauma. The postganglionic fibers—the parasympathetic—are the most vulnerable and the slowest to recover from any assault. Since they are cholinergic, the sympathomimetic fibers are in the ascendancy, and constriction of the arteries and arterioles of the nasal mucosa ensues. The resultant diminished blood supply may continue indefinitely and soon predisposes the tissues to the effects of bacterial invasions, air stream changes and other disturbances, all of which soon lead to the degeneration and atrophy of the nasal mucosa and contiguous tissues. Simple scar tissue from inflammation and trauma, notably after operations involving the septum, sinus and turbinate, may account for many minor forms of atrophy.

The fully developed syndrome of atrophic rhinitis, with fetor, crusts, bleeding, difficult breathing and other attendant physical and psychic phenomena, does not develop overnight, and lesser evidences of the same fundamental disturbances may be recognized early if looked for. These evidences—thin, dry, pale patches that

may show metaplastic changes, small crusts, sticky secretions, slight ulcers, small bleeding areas and increase in the nasal space—are frequently observed. Moderate atrophy may be present in any part or parts of one or both nasal chambers, affecting the septal and/or turbinate regions, anterior or posterior, etc., with or without involvement of the nasopharynx, pharynx and larynx. These early stages of the disease are referred to as nasal atrophy. They may progress very slowly through the years and even appear to be at a standstill. Crusts, fetor and pronounced anosmia may never occur. Yet all the commonly known symptoms and signs, in a transient or permanent form, may make their appearance at some time.

Even external nasal deformities may gradually develop, together with the structural changes within the nose. Moderate saddling of the dorsum, widening of the nose, increase in the lumens of the nasal chambers, ballooning of the upper lateral cartilages and disproportions between the lobule and the rest of the pyramid are all signs of the gradual inexorable progress of atrophy. It must be emphasized that even a minor injury to the nose sustained many years earlier may be responsible for all these changes.

There is a general agreement on the fundamental pathologic changes eventually observed in cases of nasal atrophy.

1. The nasal mucosal epithelium is replaced by squamous nonciliated epithelium.
2. There is atrophy of the mucous and other glands of the mucosa.
3. Perivascular cellular infiltration and generalized fibrosis of the subepithelial tissues are present.
4. The mucosa is thinned and ulcerated.
5. There is atrophy of the cavernous tissue and bones of the turbinates.
6. Atrophy of all tissues of the nose, internally and externally, is present.

In cases of ozena one is confronted with the destructive end stage of the progressive degeneration of tissue and function. The symptoms most complained of are fetor, crust formation, atrophy of bones, cartilage and skin, the feeling of obstructed and disturbed breathing, a poor or absent sense of smell and an impaired sense of taste. A disturbance of the sense of well-being and emotional and psychic changes are also frequently discerned.

Therapy.—Whatever one's concept of the original etiologic factors in ozena may be, its medical correction up to this time has not been adequately accomplished. Of the many varied types of management a few, such as topical and systemic endocrine, steroid and antibiotic therapy, and treatment with prostigmine and vasodilators, have proved to have some palliative value. The major emphasis in therapy, however, has been placed on surgical intervention to produce narrowing of the air passages.

Wachsberger[2] stated that surgical therapy is unwarrantedly unpopular for the following reasons:

1. There is prejudice against the use of any surgical procedure for a disease with an unknown cause.
2. There is widespread failure to understand how a surgical procedure that brings further traumatic scarring changes can help a condition with an already existing extensive degenerative process.
3. There is prevailing unfamiliarity with good surgical principles.

Many surgical methods have been tried. Rouge,[3] in 1873, recommended the curettement and removal of the entire atrophic mucous membrane of the nose. Volkmann[4] in 1882 advised removal of the turbinates. Sanger[5] in 1894 described a nasal obturator to be worn at night, and for the first time actual improvement in the disease was observed.

Lautenschläger[6] recognized the beneficial effects that resulted from narrowing of the nasal chambers and advocated fracturing and moving the lateral nasal walls toward the septum. There soon followed modifications of the Lautenschläger operation by Wittmaack,[7] Seiffert,[8] Hinsberg,[9] Halle,[10] Borries,[11] Wachsberger,[2] Baldenweck,[12] and many others.

Numerous methods have been recommended for narrowing the nasal chambers by the submucosal implantation of autoplastic or heteroplastic materials. In 1900 Gersuny[13] injected paraffin under the nasal mucosa, therewith starting the era of implants. Since then all sorts of materials have been used for the purpose. Celluloid, gutta percha, fat, rib, cartilage, fascia, bone, ivory, acrylic resins, placental implants, polyethylene and vinyl alcohol sponges are especially to be noted. Eckert-Möbius[14] in 1923 used macerated spongy beef bone. Pollock[15] in 1927 reported on the use of ivory implants under the septum mucosa. Proud[16] in 1947 used acrylic resin implants in the nasal septum, and Eyries[17] implanted them into the lateral nasal wall. Proud's contribution is most noteworthy because he emphasized the value of removal of the atrophic hard septum before introducing the acrylic implant. He reported early excellent results in all but 6 of 70 patients.

Still another kind of surgical approach to the problem was made by Rethi[18] in 1948. He constructed a baffle from the septum to obstruct the nasal chambers. In addition he utilized transplantation of Stenson's duct, as already reported by Wittmaack in 1919.

The implantation of fresh living autogenous materials under the mucosa of the septum, the nasal floor and lateral wall has also long been advised. Cartilage so used has had about the same fate as preserved isogenous and heterogenous cartilage. Fresh autogenous cancellous bone from the ilium has also had temporary value. I may have been the first to use cancellous bone as a true graft both in the septum and in the lateral wall and floor of the nose. Ogura[19] reported on the grafting of bone within the septum and agreed that it is a method of great merit. Bone grafting, of course, demands the making of a fresh bony recipient area and, in the case of the septum, requires removal first of the hard structures of the septum submucosally.

More recently rhinoplastic methods were added to the solution of the atrophy problem, and one of the first reports was made by Kopp[20] in 1940. He utilized the well-known procedure of narrowing the external nose by infracture of the nasal bones and the frontal processes of the maxillae. Wolf[21] in 1941 reported gratifying results in the treatment of atrophic rhinitis with the Joseph type rhinoplasty. Eisenstodt[22] advised combining the procedures of the typical rhinoplasty with septal implantation of preserved septal cartilage.

Universal experience has demonstrated that all surgical methods of narrowing the nasal airways are valuable. The rationale of all these operations is based on the fact that a decreased amount of air gets into the nose with each inspiration, which results in less drying of the mucosa and its secretions.

I do not consider the explanation so simple. There are at least seven factors which provoke and deserve further consideration:

1. The size, shape, and position of the nostrils in relation to the nasal pyramid affects the direction of air currents.

2. The efficiency of the valvular action of the upper lateral cartilages and its control by the lower lateral cartilages decide the laminary nature of the air streams.

3. The anterior portions of the inferior

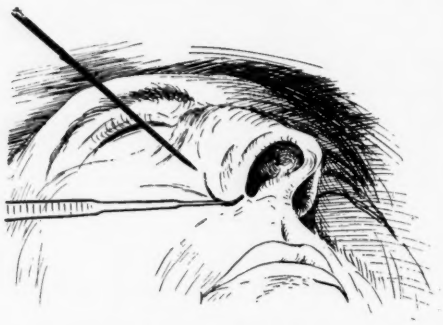

Fig. 1.—Incision in alar-labial groove.

and middle turbinates affect turbulence and direction of the air currents on inspiration.

4. The posterior ends of the inferior turbinates help to control the turbulence of the air currents on expiration and influence the amount of vapor and warmth retained in the nose. Preservation of the moisture and heat is also aided by the nasal valves and the structures of the nasal vestibules.

5. The efficiency of the erectile tissue in the inferior turbinates (and to a lesser degree the middle turbinates) determines the normal cyclic excursion of the turbinates to the septum in their response to atmospheric, emotional and other stimuli. This, together with the valvelike action of the upper lateral cartilages, regulates the resistance of the nose to inspired and expired air and thus controls the velocity and intensity of the air streams and the reciprocal relation of all these factors with the elasticity (and therefore the function) of the lung parenchyma.

6. The presence of autogenous, homogenous or foreign substances under the mucosa of the septum or any other part of the nose may incite local and reflex irritations that increase the blood supply and so stimulate the activity of the mucosal glands and other structures.

7. Materials implanted may be expected to remain *in situ* as such or to be gradually absorbed and replaced by fibrous tissue that has a new blood supply of its own.

A review of the patients that I have operated upon during the past twenty years shows that a variety of procedures was employed. In general I have utilized submucosal implants and rhinoplastic methods. In some cases autogenous bone was placed on the floor of the nose or lateral to the inferior turbinates. In others complete rhinoplasty was done, while in several a lobule operation only, or just a narrowing of the bony nasal pyramid, was performed. In a few instances, only autogenous bone was grafted onto the nasal dorsum. In some

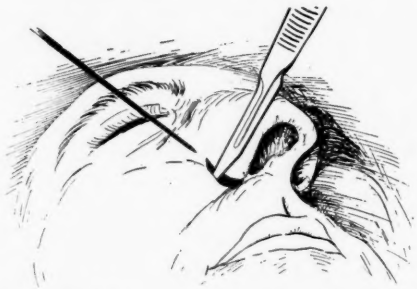

Fig. 2.—Incision of subcutaneous tissues perpendicular to (first) cutaneous incision.

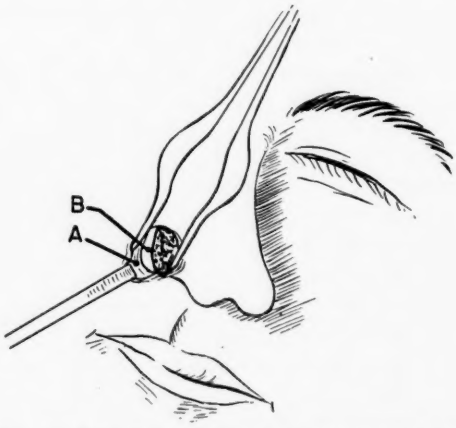

Fig. 3.—Scraping downward of soft tissues *(A)* to bare pyriform crest *(B)*.

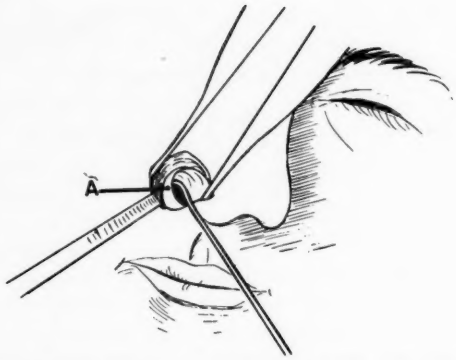

Fig. 4.—Separation of mucosa from floor and lateral wall of nose up to attachment of inferior turbinate *(A)*. This creates space.

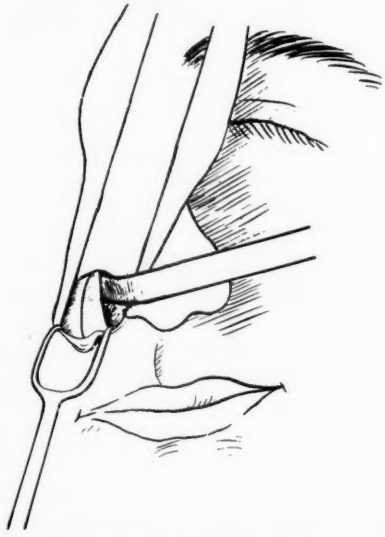

Fig. 5.—Separation of right inferior turbinate with curved chisel.

cases the same procedures were done with preserved bone. Autogenous bone was occasionally implanted on one side of the nose and refrigerated or preserved bone on the other. Combinations of these and other methods were employed.

In general, it has been my practice to do all of the pyramidal and septal operations indicated, mobilize the mucosa of the floor and lateral nasal walls and implant cancellous bone or other materials in one single operation.

Cancellous bone from the ilium is the material of choice for grafting in the septum, on the dorsum and into other parts of the nose. Autogenous bone, if available, should be used wherever a successful graft may be expected. Preserved or refrigerated cancellous bone is used for temporary implants. All varieties of bone may be used as small blocks, or sections or pieces, or may be ground and mixed with plasma and blood into a malleable mass or paste. Cartilage, living and preserved, and from any source, homologous or heterogenous, is used usually in small blocks, pieces or flakes.

Operation.—The approach to the floor of the nose and the lateral nasal wall for the implantation of all substances is through an incision of the skin at the alar-labial groove (Fig. 1). This incision is almost at right angles to the lip surface. The skin of the vestibule is usually not cut through. This is done only if the alae are to be narrowed. (All these incisions are practically invisible after healing has taken place.) A second incision through and perpendicular to the first incision divides the subcutaneous tissue and leads to the pyriform crest area (Fig. 2). Scraping the soft tissues from the anterior face of the alveolar process exposes the bone (Fig. 3) and the floor of the pyriform crest. With further scraping of the soft tissues, most of the floor and the lower portion of the lateral portion of the pyriform aperture are quickly defined. Submucosal separation of the nasal membrane from the wall and floor is now done, extending medially onto the nasal septum and laterally to the attachment of the inferior turbinate (Fig. 4). The floor of the nose meets the septal wall at nearly a right angle, and separation here can be difficult. The lateral wall meets the floor in a gentle slope,

forming a concave surface. The floor is more caudal as it extends posteriorly.

The attachment of the inferior concha begins 1 or 2 mm. behind the pyriform crest and is 35 mm. above the floor of the nose in the white adult and about 30 mm. in the Negro. This attachment is recognized in the submucous elevation by its conelike appearance when viewed from in front. The inferior turbinate bone is easily separated from the lateral nasal wall with a chisel (Fig. 5), and further moving of the lateral mucosal wall medially, together with the inferior turbinate, can be accomplished (Fig. 6). After separation of the attachment of the inferior turbinate, the distal portion of the nasolacrimal duct is also safely moved medially with the rest of the inferior portion of the lateral mucosa.

In my opinion, moving the medial bony wall of the antrums medially, as was advocated by Lautenschläger and others, is not to be recommended. The same physiologic effect can be accomplished by moving the mucosae of the lateral walls of the nose, together with the inferior turbinates, toward the septum and holding them in place with submucosal implants of bone and/or cartilage (Fig. 7).

Quantitatively, implants into the septum and the lateral walls of the nose should be substantial. They should be placed generously posterior in the septum and in the lateral nasal walls to substitute for the posterior ends of the inferior turbinates. Anteriorly the implants should be limited to the lateral wall areas, as distortion of the septum here will produce too much disturbance of the function of the os interna.

The placing of autogenous bone implants in the septum should be preceded by removal of the septum down to the hard palate. This offers a good bed for a substantial "take." The floor of the nose laterally should also be well scarified

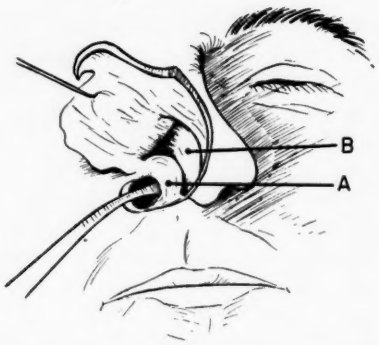

Fig. 6.—Lobule cut away to show moving of inferior turbinate and lateral mucosal wall *(A)* onto septum *(B)*.

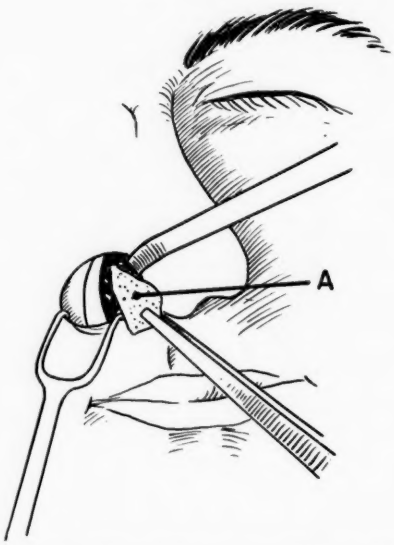

Fig. 7.—Insertion of isogenous cartilage *(A)* to hold medially displaced turbinate and mucosa close to septum.

to permit the graft to take, if autogenous bone will be available. The bony floor of the nose is several millimeters thick laterally and can usually be scarified without perforation of the hard palate. The use of despeciated live fetal bovine cartilage and bone is being studied.

If the nasal bones are greatly atrophied they can be replaced by a dorsal graft of autogenous cancellous bone.

Narrowing of the nasal lumen is considered under three headings:

1. Narrowing of the external nasal bone and cartilage vaults.
2. Narrowing of the lobule externally and the vestibules and valve areas internally.
3. Narrowing and refashioning of the nostrils.

Besides the commonly known methods of effecting these changes, some new procedures have been devised and are useful additions to the surgical armamentarium.

Special mention should be made of the value of narrowing the base of the nose by means of buried stitches just beneath the nasolabial angle and provision of a new anterior maxillary spine if indicated.

COMMENT

The implantation of materials under the lining of the lateral wall of the nose is rather a simple operation. At present I am using chiefly cartilage cut into blocks 5 to 15 mm. in diameter. Cartilage of all sorts can be used—septum, rib and ear cartilages, autogenous and homogenous, fresh and preserved. Preserved bovine cartilage from the xiphosternum and the nasal septum, live despeciated fetal (cow) cartilages and bone (mandible) have all been found useful.

Two facts stand out. First, the material used should be moderately mashed though bulky. In other words, large pieces of tissue are desirable, but sharp edges on rough rigid blocks of cartilage or bone are not well retained by the thin atrophic mucosa and can be easily extruded. Softer compressible pieces seem to be more easily tolerated. Thus all implants, especially of preserved cartilage, should be "crushed" in an appropriate apparatus at the time of insertion.

Two, the operation can be and practically always needs to be repeated. The exception is in cases of the incipient form of atrophy. Usually, in a patient with severe ozena or a pronounced atrophic state, the mucosa is so delicate and thin with multiple ulcerations that its separation from the lateral wall is extremely difficult and nearly always is accomplished only with the production of lacerations and dehiscences. The operation, therefore, cannot be as successful as desired. But even when no tears in the mucosa are produced or seen, the thin lining may in places subsequently melt away and facilitate extrusion of the implants. In the best circumstances the implants are eventually absorbed or lost; the nasal chambers are large again and the mucosal surfaces abnormally exposed. If some of the implants have been retained for a fair length of time, however, say from six weeks to six months, fibrous tissue replacement of the implants has occurred to a considerable degree and some new blood vessels have formed with and in it. A second operation (usually nine to fifteen months later) will reveal that the mucosa is thicker and safer to handle. The implants usually now stay longer in place, and clinical relief of all symptoms is quite remarkable. Such improvement is quite common, even to an exceptional degree, after a first operation. The skin stands repeated incisions remarkably well, and after five or more operations the alar-labial groove will show but slight scarring. The mucosa at a fourth or fifth operation may well be 3 to 6 mm. thick, fairly pink and showing definite evidence of increased glandular function. In no instance has there been any evidence to contraindicate the repetition of the operations. If sensitivity to an implanted material is suspected or developed or indicated by skin sensitivity tests, a different implant material should be utilized.

A factor complicating surgical intervention is the presence of a large septum

perforation. At some time in the management of the atrophy an attempt at closing the perforation can often be made. Some perforations are so large, involving most of the septum, that only an extensive plastic procedure offers any hope of solution to the problem. Fairly large holes up to 2 or 3 cm. in diameter, however, can frequently be closed in a single operation. If there has been a previous submucous resection without replacement of cartilage, separation of the septum's two nasal mucosal flaps is difficult and the operation less likely to succeed. It is in those instances in which the hard septum around the hole is still present that operative repair is most promising. After separation of the mucosal flaps via a hemitransfixion incision at the caudal end of the septum, the mucosa at the floor of each side of the nose is freed. This may be done through the hemitransfixion by first undermining the base of the nose and exposing the maxillary spine area or by means of the operation already described. The mucosa under the upper lateral cartilages must be separated, and this is done through intercartilaginous incisions. The freed mucosa can then be joined to the mucosa elevated from the septum. The procedure is done on each side of the nose separately. A horizontal incision through the mucosa, 1 cm. or more lateral to the vault of the nose, permits rotation of the mucosa medially and then inferiorly. This, together with the backward displacement of the mucosa from the floor of the nose, makes possible the sewing together of the hole in the septal mucosa. Each side should be sewn independently, if possible, and adequate cartilage and bone replaced between the repaired flaps. If the external nose is to be made narrower and smaller, a technical advantage is gained, since the nasal mucosa needed is for a smaller organ. The implants moving the inferior lateral walls inward and the floors upward provide much assistance in holding the moved mucosa in its new position. The mucosal defects in the lateral walls are covered with split skin grafts sewed onto rolled cotton moulds, fastened with sutures and held in position with gauze packing.

Short notations from 5 case records indicate the gamut of etiologic and pathologic considerations and the operative procedures commonly employed.

Report of Cases

Case 1.—After two submucous resections of the nasal septum, the patient, a man aged 40, complained of dryness and stuffiness of the nose, with much postnasal discharge. Examination revealed a moderately large nose with a "very straight thin septum, a sticky mucous discharge and a glistening, dry nasopharynx." The external nose was narrowed and in general made somewhat smaller, which gradually resulted in pronounced relief of the symptoms complained of. Improvement persists seven years after the operation.

Case 2 *(Mild Nasal Mucosal Atrophy).*—Nasal mucosal atrophy followed an operation in a man aged 50, with further atrophy after polyp, sinus and septum surgery 9 years previously. The operation consisted of removal of the septum and subsequent reconstruction; removal of more polyps; reconstruction of the upper lateral cartilages, which showed complete returning on themselves, and the whole nose, especially the lobule, was made smaller. Two weeks after the operation the patient reported ability to taste for the first time in eighteen years, and also the return of the sense of smell.

Case 3 *(Congenital Deformities with Severe Atrophic Rhinitis).*—A girl aged 17 had a flat, wide saddle nose with no nasal bony vault. There was a spur on the right side of the septum, with marked concavity of the left side. The nose and throat were dry. There was a thick, sticky discharge, with large crusts easily dislodged and some odor. Synechiae were present between the upper lateral cartilages and the septum. The patient had a protruding upper jaw and teeth, and a retracted chin. There was ballooning of the right nasal valve. The floors of the pyriform crests were considerably above the

floors of the vestibule, the left being 5 mm. above the level of the right. Operation consisted of (1) narrowing of the lobule; (2) freeing of the upper lateral synechiae, with subsequent skin grafts; (3) mobilization and reconstruction of the septum; (4) reconstruction of the anterior maxillary spine; (5) implantation in each lateral mucosal pocket of more than 20 large pieces of preserved bovine cartilage, and (6) implantation of despeciated bone and isogenous cartilage into the dorsum. Improvement in breathing and general well-being were promptly noted by the patient and members of her family.

CASE 4 *(Severe Atrophic Rhinitis).*—A woman aged 45, offered a fairly typical story of severe atrophic rhinitis with some fetor. Crusts, odor and difficulty in breathing were among the most prominent symptoms. The first operation, in 1954, consisted of mobilization of the septum and its imbrication about 8 mm. below the dorsum. The lobule was narrowed and the nose in general made smaller. Lateral nasal mucosal pockets were created and pieces of polyvinyl sponge implanted. Lateral osteotomies were done and bilateral complete returning of the upper lateral cartilages was corrected. Ten months later the sponge material was removed on account of excessive irritation and some cartilage implanted. Eleven months later a third operation was done, consisting of implantation of 50 pieces of infantile and adult preserved rib cartilage into each lateral nasal pocket and of 40 flakes of similar cartilage over the nasal dorsum. At the time of writing, two years after the last operation, there are no further crusts, and only a slight nasal discharge. The sense of smell is often present. The patient's general health has improved, and she "feels good." Still further implantation of cartilage is indicated and is now being considered.

CASE 5 *(Ozena).*—A woman 45 years old had lost the sense of smell, and nasal symptoms had gradually developed, beginning at the age of 9 or 10. Before the first operation the chief complaint was of terrifically large crusts, frequently as large as her thumb, which caused difficulty in breathing, headaches and pains about the eyes and face, and a sense of being feverish. The patient spent an hour irrigating her nose every day. She had no appetite; food had no particular flavor, but on the contrary had a bad taste and an unpleasant odor. There was a continuous postnasal discharge with drying and crusting of the walls of the pharynx, which was parched, irritated and raw. Crusts here were hard to remove and recurred in less than twelve hours.

The first operation was, in general, a "smalling" operation on the nose (complete rhinoplasty with implantation of cancellous bone onto the floors of the nose and the lateral walls). Some improvement occurred; food began to have a better flavor, but gradually the grafted bones became absorbed, and many of the symptoms, especially headaches, recurred and resisted all treatment. One year later polyethylene pellets were implanted on the right side of the nose. Five weeks later a slight return of the sense of smell was noted, together with an improvement in the sense of taste and the ability to distinguish different flavors. Less crusting was noted. The mucous discharge was not as thick as before. Ten months later the left lateral nasal wall was uncovered and polyvinyl plastic sponge implanted. Shortly after this operation the sense of smell became quite acute and the sense of taste improved, as did breathing. Irrigations were resumed four weeks after the operation but were more effective and less troublesome. Three months later the left side of the face swelled and continued thus for a week. Considerable blood-stained mucus was expelled from the left side. Local treatment with infra-red rays and diathermy was used and apparently helped to produce an improvement of this complication. Eventually there was much less crusting, and the mucous discharge became noticeably thinner and could be easily expelled by blowing or in-sucking. The patient was now extremely sensitive to the smell of many things and to the aroma of onions and cigarette smoke. She noted that she was sensitive to milk, white bakery goods, ice cream and alcoholic beverages.

About four years after this implantation of polyvinyl the sponge started to extrude and then was completely removed. Six months later both lateral mucosal pockets were again exposed; the polyvinyl was removed, and 64 pieces of infant rib cartilage were implanted on the right side and about 24 on the left. About 90 flakes and pieces of isogenous cartilage were implanted over the whole dorsum of the nose and a few pieces around the nasal tip. At the time of writing, two and one-half years after this, the patient

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has gained 20 pounds (9.1 Kg.) in weight, looks healthy and well and has but few nasal symptoms or disturbances of any kind. She has regained her sense of smell, her husband (who had obtained a divorce because of the extreme fetor), her job and her social status.

SUMMARY

Nasal atrophy is a fairly common illness, involving a small or large portion of the nose, which may or may not lead to atrophic rhinitis and ozena. Evidences of early nasal atrophy can be easily discerned by the usual methods of nasal and pharyngeal examination. Treatment consists of a regimen of medical and surgical measures. The newer antibiotics, corticosteroids, endocrine and vasodilators have some value in the care of these diseases and the nose-narrowing and nose-reducing operations can be successful without adding to the destruction of vital tissues. Implantation of cartilage and other materials under the mucosa of the lateral walls of the nose and the septum is exceptionally valuable and can and should be repeated many times, if necessary, at intervals of ten to twenty months for five to ten years. Clinical, social, and emotional rehabilitation can be accomplished and is most gratefully received.

RIASSUNTO

L'atrofia nasale è un'affezione abbastanza frequente, che interessa più o meno diffusamente il naso e che può condurre alla rinite atrofica e all'ozena. I suoi primi segni sono facilmente riconoscibili con gli esami comuni naso-faringei e la cura è medica e chirurgica. I nuovi antibiotici, i corticosteroidi, gli ormoni e i vasodilatatori hanno ottenuto buoni risultati, come pure gli interventi di restringimento e di riduzione delle cavità nasali. L'impianto di cartilagine o di altri materiali al di sotto della mucosa delle pareti laterali del naso e del setto porta a risultati eccezionali e può essere ripetuto quante volte sia necessario, ad intervalli di 10-20 mesi per 5-10 anni. Si ottiene, in tal modo, una riabilitazione clinica, psicologica e sociale.

ZUSAMMENFASSUNG

Die Atrophie der Nase ist eine ziemlich häufige Krankheit, die kleinere oder grössere Abschnitte des Organs befallen mag und manchmal zu atrophischer Rhinitis und Ozäna führen kann. Frühe Anzeichen der Nasenatrophie können mit den üblichen Methoden der Untersuchung der Nase und des Rachens leicht erkannt werden. Die Behandlung besteht in der Anwendung medizinischer und chirurgischer Massnahmen. Die neueren Antibiotika, Kortikosteroide, Hormone und Vasodilatoren sind von gewissem Wert in der Behandlung dieser Erkrankung, und die chirurgischen Massnahmen zur Verengerung und Verkleinerung der Nase lassen sich ohne zusätzliche Zerstörung lebenswichtiger Gewebe ausführen. Besonders wertvoll ist die Einpflanzung von Knorpel und anderem Material unter die Schleimhaut der seitlichen Nasenwände und des Septums. Dies kann und sollte häufig wiederholt werden, nötigenfalls in Zwischenräumen von 10 bis 20 Monaten für die Dauer von fünf bis zehn Jahren. Es lassen sich Erfolge in klinischer, sozialer und seelischer Hinsicht erzielen, die mit grossem Dank seitens der Kranken entgegen genommen werden.

RÉSUMÉ

L'atrophie nasale est une affection courante, impliquant une plus ou moins grande partie du nez, dont peut résulter une rhinite par atrophie ou un ozène. Les symptômes de l'atrophie précoce sont d'un diagnostic aisé par les méthodes d'examen courantes. Le traitement consiste en une série de thérapeutiques médicales et chi-

rurgicales. Les nouveaux antibiotiques, corticostéroïdes, extraits endocriniens et vasodilatateurs ont leur valeur dans le traitement de cette affection, et les opérations en vue de la diminution et de la réduction du nez, peuvent s'avérer efficaces sans que l'on ajoute à la destruction des tissus vitaux. L'implantation de cartilage et d'autres matières sous la muqueuse des parois latérales et de la cloison nasale est des plus utile; elle peut et devrait même être répétée à plusieurs reprises si nécessaire, à intervalles de 10 à 20 mois durant 5 à 10 ans. Une réhabilitation totale clinique, sociale et esthétique est ainsi possible; elle est toujours accueillie avec une très grande reconnaissance.

RESUMEN

La atrofia nasal es una afección bastante frecuente, que afecta una mayor o menor parte de la nariz y que puede conducir a la rinitis atrófica o al ozena. Los signos de comienzo de la enfermedad pueden descubrirse facilmente con los métodos corrientes de exámen nasal o faríngeo. El tratamiento consiste en un régimen de medidas médicas y quirúrgicas. Los nuevos antibióticos, corticosteroides, medicamentos endocrinos y los vasodilatadopres tienen un cierto valor en el tratamiento de este proceso, y las operaciones de estrechamiento y reducción nasal pueden efectuarse sin añadir destrucción de tejidos vitales. La implantación de cartílago u otro material bajo la mucosa de las paredes laterales de la nariz y del septum solo excepcionalmente tienen valor y por ello deben ser repetidas muchas veces, si es necesario, a intervalos de diez o veinte meses a lo largo de cinco o seis años. Se puede conseguir una rehabilitación clínica, social y psíquica, cosa que el enfermo agradece considerablemente.

SUMARIO

A atrofia nasal é molestia comum, comprometendo parcial ou totalmente levando ou não a rinite atrofica e ao ozena, sinais que podem ser obtidos durante osmétodos usuais de exame rinologico. O tratamento consiste em medidas clínicas e cirurgica. Os antibioticos mais recentes, corticoesteroides, hormonios e vasodilatadores podem ter algum valor como tambem as operações de redução e correção nazal. Os implantes de cartilagem e outros materiais sob a mucosa das paredes laterais e do septo são muito animadores e podem ser repetidos muitas veses em intervalos de 10-12 meses em cinco ou dez anos. A rehabilitação emocional, clinica e social é uma consequência vantajosa.

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Disorders that arise out of the conditions of modern civilized life can only be treated palliatively, since their cause cannot be eradicated except by a return to barbarism, a step some might approve, but few would advocate. No group of diseases has evoked a greater number of suggested remedies or provided a readier opening for heterodox ones; for where successive methods have failed, unschooled enthusiasm is the more prone to grasp at any that are new and credible. I would mention more especially in this connexion the right-sided abdominal failures, intestinal stasis, coloptosis, caecal distension, and all the troubles in the right iliac fossa for which appendix is so often blamed without reason and removed without benefit. These are maladies of civilization, maladies of early adult life, and most commonly maladies of women. They are the outcome of a failure of one or more of the many factors which combine to keep the large bowel working normally under normal conditions—factors mental, muscular, and dietetic. In their earlier stages, before organic changes have taken place in the colon, before its walls have changed their structure and lost their contractile power and become fixed in some faulty place or posture by adhesions, they can be alleviated and even cured by attention to these factors.

—Ogilvie

Thoracic Surgery

Control of Bronchial Mucus in the Postoperative Period

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REMOVAL of accumulated secretions from the tracheobronchial tree is essential throughout the entire postoperative period; and unless the surgical patient can eliminate these secretions effectively by coughing, he must be assisted by a combination of pharmacologic, physical and mechanical means.

Obese, debilitated and elderly patients need help most often. Trouble may be expected with patients who have chronic bronchopulmonary infection and emphysema, but such trouble can be avoided if it is anticipated. The respectful attention to bronchial toilet that is standard practice after thoracic and laryngeal operations can be applied profitably to all surgical patients, particularly after lengthy operative procedures.

Stagnant bronchial secretions, remaining in the periphery of the bronchial tree, become thick and tenacious, and they encroach upon the lumens of the smaller bronchi or plug them completely. This resistance to the flow of air into and out of the affected portions of the lung reduces ventilation and interferes with alveolar gas exchange. As a result, alveolar respiratory insufficiency is impaired to such an extent that hypoxia, hypercapnia and respiratory acidosis appear.

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Complete plugging of the bronchi, which is the end point of bronchial stasis, causes massive or segmental atelectasis and pneumonitis; and it may handicap pulmonary function to a serious degree. Not infrequently, this chain of events progresses so rapidly that the condition of a patient with excessive and retained bronchial secretions becomes critical in a very short time. Such a patient literally drowns in his own secretions.[1] Survival of the acute phase does not eliminate the possibility of residual atelectasis or chronic pneumonitis.

Bronchial Secretions. — The tracheobronchial tree is bathed continuously by secretions from the goblet cells in the mucous membrane and from the tuboalveolar glands in the muscular layer of the tracheal and bronchial walls. The thick and adhesive mucin secretion of the goblet cells is separated from the mucous membrane by a thinner, serous layer of fluid secreted by the tuboalveolar glands. Thus a two-layer blanket is formed. The more adhesive layer faces the bronchial lumen; the thinner layer is in contact with the mucous membrane. The blanket adheres tightly enough to the membrane to prevent occlusion of the bronchial lumen and yet is fluid enough to be moved in an oral direction. This cleansing mucus blanket is

in constant motion toward the larynx as foreign substances, cell detritus, exudates and bacteria are caught up in it.

Goblet cells are spaced irregularly in the mucous membrane between the ciliated columnar cells. These cells are observable throughout the tree, as far peripherally as the respiratory bronchioles. Tuboalveolar glands of serous and mucoserous type are located just under the muscular layer and are present as far distally as the bronchioles of 1 mm. diameter.[2] Bronchial secretion is more viscid in the smaller and peripheral bronchi. It is thinned as it is moved orally.

When the bronchial membrane is continuously irritated by smoking, or in the presence of allergy or dehydration, the production of mucin is increased. This increases the viscosity and adhesiveness of the covering layer. In the presence of infections of the upper part of the respiratory tract or chronic bronchitis or bronchiectasis, an exudate is added from the capillaries under the bronchial mucosa.

Bronchial Dynamics.—The blanket of bronchial secretions is moved continuously in a central direction from the smaller bronchioles to the larynx. Constant movement in the system is provided by (a) ciliary action, (b) bronchial peristalsis (c) changes in bronchial contour, and (d) cough.

It is an error to look upon the tracheobronchial tree as a rigid system of motionless tubes encased in cartilaginous rings. Chevalier Jackson spoke of the tracheobronchial tree as a "living, moving labyrinth of resilient tubes enlarging in lumen, changing in contour and elongating on inspiration; diminishing in lumen and length, changing in contour and swaying, on expiration."[1]

Both main stem bronchi arise from the trachea and divide into smaller bronchi that supply the segmental units of the lung. Dichotomous division proceeds peripherally to the bronchioles. Alveolar ducts and alveolar sacs arise from the smallest bronchial divisions, which are the respiratory bronchioles. Bronchi vary in size from half the size of the trachea to 1.5 mm. in diameter. Bronchioles have a diameter of less than 1.5 mm. Terminal bronchioles have a diameter of about 0.5 mm.[2]

The trachea and the major bronchi are stiffened by cartilaginous rings over three-quarters of their circumference. Irregular plates of cartilage are found in the walls of some bronchi that measure no more than 1 mm. in diameter. Smooth muscle fibers are present in the tracheal and bronchial walls as far peripherally as the terminal ends of the respiratory bronchioles. Elastic fibers are present in the bronchial walls throughout all portions of the tracheobronchial tree.

These anatomic structures are responsible not only for bronchial peristalsis but for the ceaseless alterations of bronchial contour that are synchronized with inspiration and expiration. The gross movements of the bronchial tubes provide for the elimination of larger particles and heavier accumulations of mucus from the tubes of greater diameter. An uninterrupted movement of the fluid blanket is provided by ciliary action.

Ciliary Action.—Ciliated pseudostratified columnar epithelium on a basement membrane is present as far peripherally as the respiratory bronchioles; here the epithelium changes to low cuboidal. The cilia are extremely efficient in propelling mucus and foreign material. Motion of the cilia is wavelike, and the action is described as having the appearance of undulations seen in windswept grain in a field.[3] Each individual cilium moves orally with a whiplike motion and then returns slowly to its original position. The rate of ciliary transport is estimated at 0.3 mm. per second. The cilia move in

the underlying layer of lower viscosity with only the tips protruding into the overlying tenacious strands of mucus. With excess of mucin, cilia become entangled and their efficiency is reduced.

Ciliary action is most important in cleansing the smaller bronchi and bronchioles. The constant wavelike motion of the cilia keeps small bronchi free from foreign particles and bacteria. As particles and aggregates of mucus increase in size and become heavier in the larger bronchi, ciliary action becomes less effective, and peristalsis comes into play.

Certain general anesthetics and many sedatives depress ciliary activity. Since the effectiveness of cilia is influenced by the viscosity and stickiness of the material in contact with them, anesthetics and drugs that cause drying in the respiratory tract reduce ciliary efficiency. Oxygen in the absence of proper humidity has a similar effect. Metaplasia of ciliated columnar epithelium to nonciliated squamous epithelium may take place in the presence of allergy and in chronic bronchial infections.

Bronchial Peristalsis.—Peristalsis is a function of the bronchial tubes. Rhythmic wavelike movements are demonstrable throughout the bronchial system by roentgen examination after the instillation of radiopaque lipiodol.[4] Peristaltic movements flow centrally and assist in the movement of mucus and foreign material in an oral direction. The combination of these wavelike motions with the expanding and constricting contour changes provides a *squeezing action* that is necessary for forceful movement of respiratory tract fluid.

Bronchial peristaltic action is decreased by morphine and by the central nervous system depression that is associated with anesthesia.

Changes of Bronchial Contour. — Changes of contour include alterations in the luminal diameter and alterations in bronchial length. The smaller bronchi and bronchioles expand during inspiration and contract during expiration. During inspiration the lung root moves downward, forward and laterally. It returns to its original position during expiration. Thus the trachea and the bronchi become elongated during inspiration. As the thoracic cavity enlarges during inspiration and the lung expands to fill the cavity, the bronchial tubes are stretched out peripherally. The elastic fibers in the tracheobronchial walls are responsible for the recoil during expiration.

Primary and Secondary Mechanisms for Elimination of Mucus.—The respiratory tract fluid that bathes and cleanses the membrane and that eliminates aspirated particles is brought to the larynx by the movements discussed above: peristalsis, change of contour and ciliary action. Normally the secretion is then spilled over from the larynx and is swallowed. When there is any derangement in the physiologic secretory and eliminating mechanisms, the cough mechanism comes into play.

Cough: Cough may be reflex or voluntary. The mechanism is composed of a deep intake of air followed by jerky expiratory movements against a closed glottis. The glottis then opens suddenly with an expulsive discharge and expectoration. The air current produced by coughing is violent. The chief muscle involved is the diaphragm, its amplitude during the paroxysm amounting to three to four times that associated with normal breathing. In addition, the abdominal muscles are contracted powerfully. The current of air inspired during the first phase of cough enters the lung distal to the plug of mucus. The most sensitive trigger points for the cough reflex are located in the lower trachea and about the carina.

The cough reflex is depressed during

anesthesia and during the postanesthetic period. It is depressed additionally by sedatives administered for pain, and it is suppressed voluntarily by patients when coughing is painful.

Bronchial Plugging and Bronchial Spasm. — Plugging in the postoperative period is due to a combination of factors: (1) diminished bronchial caliber that is the result of bronchial spasm and edema of the membrane, (2) reduced respiratory excursion, (3) ineffective effort to cough when coughing is painful, (4) depression of both ciliary activity and bronchial peristalsis, and (5) excessive and tenacious secretions.

Plugging causes atelectasis. If the atelectatic area is not opened within a short time, pneumonitis supervenes. Atelectasis will persist for weeks or months if the bronchus remains closed, and the final state then is one of a chronically infected segment or lobe, or even an abscess.

Because of the smooth muscles incorporated in their walls, the bronchi and bronchioles can change significantly in caliber. Contraction of these muscles in bronchial spasm reduces bronchial diameters to a serious degree, particularly when edema of the membrane has already reduced the natural luminal diameters. Bronchial spasm may be initiated in a number of ways: allergy, inflammation, chemical irritation and foreign material, including tenacious mucus.

It has been pointed out that the smaller bronchi and bronchioles expand during inspiration and contract during expiration. The effect of bronchial spasm on ventilation is therefore more pronounced in the expiratory phase of respiration. Air entering the primary respiratory lobules is trapped partially because of the narrowing of the bronchioles during expiration. Emphysema develops distally to any point of spasm.

This has a direct bearing on the elimination of bronchial secretions, in that mucus is "trapped" in the areas of diminished caliber. The evaporating effect of ventilation in the bronchi complicates the problem further by drying the secretions, which become thick and ropy. This sticky mucus cannot be moved either by ciliary action or by the squeezing of peristalsis and contour changes; nor can it be dislodged by coughing.

Diagnosis of Retained Secretions. — It is important to bear in mind that not all postoperative respiratory problems are necessarily the result of retained bronchial secretions. In the differential diagnoses consideration must be given to pulmonary circulatory defects, problems of cardiac output, parenchymal lesions of an inflammatory nature and the problems that arise from defects of alveolar capillary diffusion. Retained secretions are the most frequent cause of postoperative pulmonary problems.

Diagnosis of the sequelae of retained bronchial secretions is sometimes difficult because the problem arises in a patient who is already ill and who, in addition, is sedated. When the onset is marked by sudden thoracic pain with dyspnea, fever, unilateral restriction of respiratory motion and tachycardia, the diagnosis is quite evident (Figs. 1 and 2). This, however, is not the usual picture. The patient may offer no complaints and the signs may be few, such as a localized change in breath sounds, an alteration of respiratory excursion, a slight rise in fever, an increase in pulse rate or a cough. It is important to remember that a negative roentgen film of the chest does not rule out pulmonary complication. Moreover, small, ill-defined, linear, platelike or other fuzzy shadows may be the only evidence available on which to base the diagnosis. Whenever the diagnosis of mucus plugging in the tracheobronchial tree poses a

difficult problem, use of the bronchoscope diagnostically or as a trial therapeutic measure may be advisable.

It is not a single or simple plug of mucus that closes the bronchus like a cork. All of the bronchial branches are filled with thick sticky mucus. Nor is the mucus to be extracted as one cohesive mass; rather, cleaning out of the bronchus progresses distally by repeated withdrawals of the aspirating tube. In the patient whose roentgen film is reproduced in Figure 1, the aspirated mucus measured 247 cc. Filling of the bronchus with mucus is gradual, even though the final closure and the clinical onset may be sudden.

Proper control of postoperative bronchial mucus calls for close teamwork by surgeon, internist and bronchoscopist. Frequent observations are necessary. Medications and procedures are used carefully, and the problem is approached critically. There is no place for empiric treatment or "general measures."

Treatment. — The postoperative management of retained bronchial secretions should be anticipated, so that the problem can be dealt with first by preventive measures designed either to decrease excessive mucus or to favor its elimination.

Infections of the upper part of the respiratory tract occurring within the two-week period prior to operation will be responsible not only for an increased production of mucus but for a variable amount of exudate of high viscosity. Elective surgical intervention should be postponed until after acute infections have passed the exudate stage. Recurrent and chronic bronchial infections should put one on guard against postoperative trouble, even though such conditions are not actual contraindications to operation.

The increased mucus encountered in heavy smokers can be reduced and thinned by two weeks of abstinence from tobacco. Such a period of abstinence will make a significant difference to a patient who is to undergo an elective operation on the upper part of the abdomen, particularly the obese patient or any person whose operative procedure will require one or two hours of anesthesia.

If postoperative trouble is anticipated, a regimen of bronchial cleansing for three days prior to surgical intervention will help to forestall, or at least minimize, bronchopulmonary difficulties after the operation. We have been using a preparatory routine four times daily during the three days prior to operation. With each treatment an aerosolized bronchodilator drug is used for five minutes. This is followed by a five-minute period of drainage over a chair or a bed. The routine is concluded with five "practice coughs."

Bronchial Dilators. — The aerosol sympathomimetic drugs are perhaps the most effective bronchial dilators. These include isoproterenol, which is epinephrine-like in action. Our choice has been Isuprel (Winthrop). This is employed most often in a nebulizer as a 1:200 solution for ten minutes every four hours. Nebulization is produced either by a hand bulb or by oxygen flow from a tank. The drug is effective also in the form of linguets, 10 mg. at four-hour intervals, but limited to 40 mg. in twenty-four hours.

Epinephrine is effective. The refined epinephrine-like drugs, however, have the advantage of producing fewer undesirable effects. A further decongestive action is obtained by combining a bronchial dilator, such as Isuprel, with a vasoconstrictor. The additional reduction in edema of the membrane is beneficial.

The route of administration is important. Nebulization is best. Oral medication cannot be relied upon during the immediate postoperative period. Absorption from the rectum is satisfactory, and rectal suppositories, therefore, are useful. Oral linguets are of value because

they provide for absorption directly from the mouth and can be used almost immediately after an operation.

Detergents. — The liquefaction of viscid mucus by means of mucolytic agents and enzymatic digestants is of the first importance in eliminating secretions from the bronchial tree. If water can penetrate tenacious mucus to a sufficient degree, the mucus will become more fluid and will slide along the surface of the bronchial membrane more readily. It is not necessary to liquefy the entire volume of mucus to promote transport. Only the surface need be penetrated to produce the necessary change in the mucus-epithelium interface.

We have used Tergemist (Abbott) and Alevaire (Winthrop). These are aqueous solutions of the mucolytic agents. Tergemist contains potassium iodide in 0.1 per cent strength. The iodide is absorbed from the bronchial epithelium and acts upon the mucous glands to decrease the viscosity of their secretion. The addition of glycerin to a detergent appears to offer no advantage; but rather, it presents the distinct disadvantage of accumulating in the inhalation therapy equipment. Sodium bicarbonate, when used as a buffer in detergent solution, would appear to cause bronchial irritation.

The detergents are used in aerosolized form, most efficiently with aerosol generators attached to tanked oxygen. They are used on an hourly basis or continuously. The aerosolized solution may be delivered to the nasopharynx by means of a face mask or nasal catheter or into the trachea through a tracheotomy tube.

Solutions of pancreatic enzymes such as Dornovac (Sharpe and Dohme) may be aerosolized alone or combined with detergents.

Proteolytic enzymes such as Tryptar (Armour), Chymar (Armour) or Parenzyme (National Drug) are effective

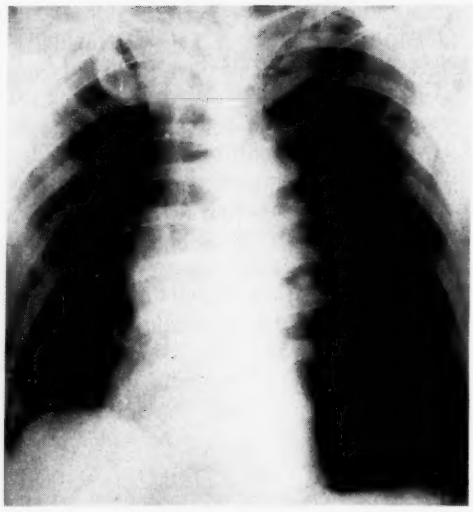

Fig. 1.—Mucus plugging of the right bronchial tree in 62-year-old man twelve hours after inguinal herniorrhaphy. There is obvious shift of the mediastinum to the right, with decreased aeration of the right lung and increased aeration of the left lung.

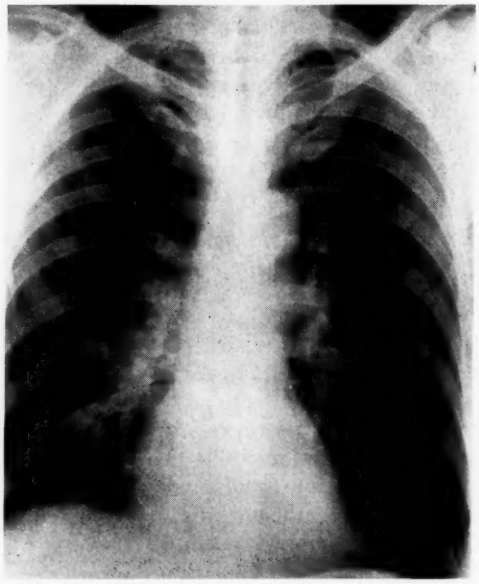

Fig. 2.—Same patient as in Figure 1, taken immediately after bronchoscopic removal of 247 cc. of thick ropy mucus. The mediastinal position has been restored to normal, and the right lung is aerated.

when given intramuscularly. Whether the lytic action of these substances, when given parenterally, is directly upon the bronchial mucus or is due to an indirect activation of lytic forces within the body is not known. It is possible that trypsin stimulates local circulation and thereby reduces local edema.

Humidification.—Gases delivered to the respiratory tract should be saturated with moisture (100 per cent humidity). This condition is met by the fog produced with water or aqueous solutions by means of an aerosol generator. Gases that are not properly humidified are irritating to the respiratory surfaces. They exert a drying effect and thereby increase the tenacity and viscosity of secretions. Proper humidification will maintain the moisture content at all levels of the tracheobronchial tree, irrespective of changes in the temperature of the air during respiration. If aerosolization is occurring correctly, fog can be seen when the tubing leading from the aerosol generator is held up to the light. If fog is not visible, the apparatus is not performing properly.

Bubble bottles are obsolete, because they do not supply saturation. "Steamers" of all sorts likewise do not accomplish their assigned purpose. While the humidity may be 100 per cent directly in the stream of air coming from these machines, it is much less only a short distance away; and the only place where the degree of saturation is of concern is deep within the respiratory tract. If saturated room air does not contain microscopic aerosol particles, it will become unsaturated as it is warmed in the respiratory passages. A window or any other cool object in the room will cause condensation of moisture that is dispersed throughout the room and away from the patient. This results in the puddles of water observed so frequently on the floor under the window; the moisture is on the floor rather than in the air.

When using most aerosol generators it is best to use tubing of a relatively small caliber and not much longer than is necessary to reach the patient. This will prevent condensation in the tubing and the aspiration of water. For the same reason, the large-caliber tubing used with the "fog bottle" makes it necessary to place this type of humidifying apparatus below the level of the patient, so that water will drain back into the bottle.

Other Agents.—Iodides have a thinning effect on bronchial secretions, and they are useful when given intravenously. They are not tolerated in the postoperative period when given orally. Sodium iodide is given intravenously in doses of 0.5 to 1 Gm. added to 500 to 1,000 cc. of the fluids that are used ordinarily to maintain fluid and electrolytic balance. This dose can be repeated two or three times daily.

Exsufflation.—The purpose of exsufflation by machines is assistance in expelling bronchial secretions when this is not accomplished by the patient's cough mechanism. The procedure utilizes a rapidly moving stream of gas for transport. Since pressure changes are used, a closed system is necessary. During inspiration a positive pressure of 20 to 30 cm. of water is exerted for two and one-half seconds. Then a time-controlled valve is tripped to change the pressure suddenly to 20 to 40 cm. of water, negative pressure. These absolute pressure values do not disturb the thoracic cavity because they are not left in operation for a sufficient length of time. Instead, the pressure changes merely cause a rapid expulsive stream of gas to facilitate propulsion of intrabronchial material. The flow of gas may approach the rate of 10 liters per second.

Two makes of equipment are available, the Ventilaire and the Cofflator. We use the Cofflator. The patient is exposed to

five cycles of positive-negative pressure and the five cycles are repeated five times at one-minute intervals. The procedure may be repeated four or five times at thirty-minute intervals. It is customary to utilize aerosol and detergent therapy between treatments. Negative pressure exsufflation usually does not mechanically bring secretions out of the patient's respiratory tract; it merely institutes mobilization to a slightly higher level in the bronchial tree. Mucus is then expelled by the patient's coughing effort. Usually productive coughing is not observed until after the second or third half hour of treatment. The exsufflator, when used properly, is safe; severe debility is not a contraindication to its use.

Postoperative Endoscopic Procedures.—Even after careful application of preventive and active measures, both medicinal and physical, bronchial mucus may become a serious postoperative problem. Patients are weak after an operation, some more than others, either because of the underlying disease or because of the nature of the operative procedure. They just cannot cough out the accumulated mucus. Sometimes coughing is suppressed voluntarily because of the pain it brings forth. Sedatives given for pain, and the dehydration that is the result of both disease and surgical intervention, interfere further with bronchopulmonary elimination. The tracheobronchial tree may be flooded with aspirated gastric contents, with pharyngeal secretions or with blood.

When bronchial secretions are excessive and stagnant they must be removed mechanically by endoscopic aspiration. This should be done in the operating room while the patient is fully anesthetized or in the recovery room at the conclusion of the operative procedure. During the postoperative period consideration is given to (a) the type of endoscopic procedure, (b) the anesthesia required for endoscopy and (c) the locale in which the procedure is to be performed.

In many instances simple catheter aspiration of the trachea through a laryngoscope will be sufficient. This is accomplished with a semirigid silk woven aspirating tube passed through the larynx which must be visualized through the laryngoscope. The catheter is passed to the carina. Cooperation of the patient is necessary, for he must cough actively during the aspiration in order to force bronchial secretions up to the catheter in the trachea. This method can be employed by the anesthetist or by the attending surgeon. It does not require the expertness of the bronchoscopist. By this simple procedure one who is inexperienced in bronchoscopy can loosen and withdraw obstructing bronchial mucus.

Without question, bronchoscopic aspiration with spot suction is more effective, because obstructing mucus can be removed directly from the smaller bronchi under direct vision. Often these mucus casts are so tenacious that the patient cannot dislodge them by coughing, and in such instances simple catheter aspiration of the trachea is inadequate. Bronchoscopic aspiration must be executed rapidly and as gently as possible, so that the patient will not be fatigued.

One rarely has need for any but the most superficial topical analgesia, a simple spray of 4 per cent cocaine or 5 per cent Cyclaine to the fauces and pharynx. Premedication is not used. Such drugs as morphine, Demerol and the barbiturates are undesirable, because they suppress further an already inadequate cough reflex. Furthermore, synergetic aspiration presupposes a tussive effort on the part of the patient. Atropine is never used because its drying effect makes an already adherent-coherent bronchial mucus even more tenacious. If the patient is strong and active, it is sometimes help-

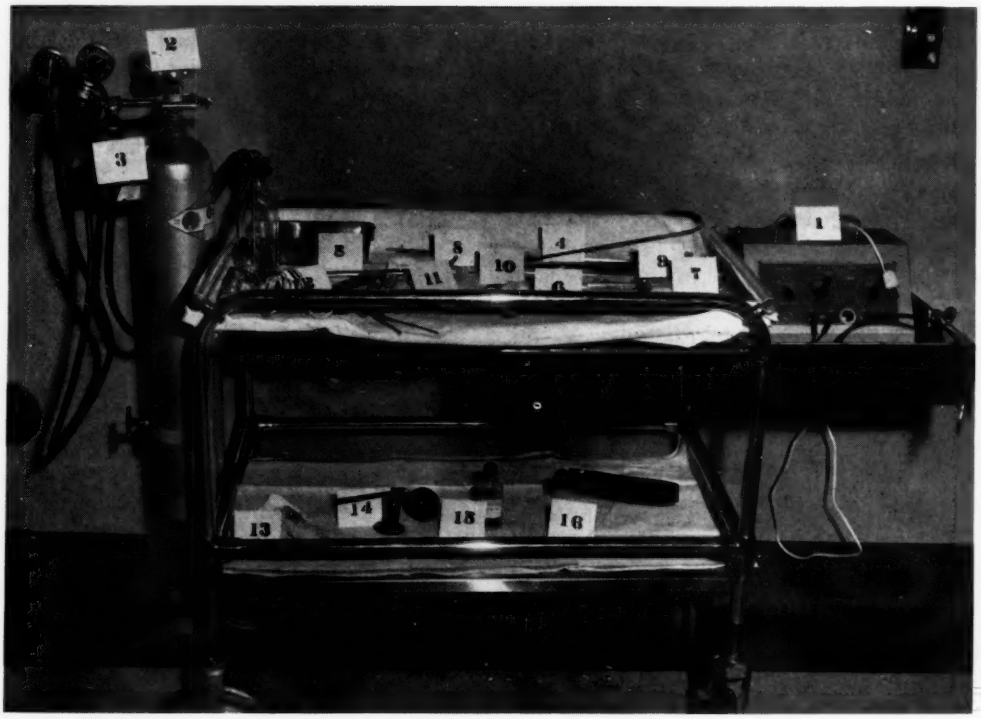

Fig. 3.—Emergency bronchoscopic cart. *1*, battery; *2*, oxygen tank; *3*, valve for releasing oxygen to obtain suction; *4*, aspirating tube; *5*, pan for saline solution; *6*, infant laryngoscope; *7*, adult laryngoscope; *8*, infant bronchoscope; *9*, adult bronchoscope; *10*, silk woven catheters; *11*, intratracheal tubes; *12*, rubber catheters; *13*, lubricant; *14*, atomizer; *15*, cocaine solution; *16*, eye shield. Operative technic (see text).

ful to instill a few drops of 5 per cent or 10 per cent cocaine or 5 per cent Cyclaine into the larynx. Usually this will not be necessary.

During the first few postoperative days it is sometimes better to perform endoscopy in the patient's room. This will avoid the disturbance entailed in moving him to the operating theater, and it will save time when the situation calls for all possible haste. When convenient, however, the procedure is more efficiently executed in the operating room.

A specially designed cart containing the essential equipment for aspiration and suction is extremely useful. This cart can be moved quickly to any operating room, ward, private room or emergency room. It is provided with laryngoscopes, bronchoscopes, catheters, intratracheal tubes, equipment for topical anesthesia, bronchoscope batteries, oxygen and suction equipment (Fig. 3).

For carrying out bronchoscopic or laryngoscopic aspiration in the operating room, the standard position of Jackson is used: the patient's head and shoulders off the end of the table, neck flexed on chest, head extended upon the neck. The head is held by a "head-holder," who may change the position of the patient's head at the endoscopist's direction. An alternative method is that which keeps the patient's head upon the table, with the shoul-

ders elevated by a triangular bolster or sandbag and the head extended over the bolster. An assistant stands over the patient, holding his shoulders down so that he does not flex his thorax on the abdomen.

When the endoscopic procedure is performed in the patient's room, the second method is advantageous. Here the patient is lying crosswise in bed, and his head is under the control of the endoscopist. The patient's head is allowed to hang partially unsupported off the edge of the bed. In still another method a semisitting position is obtained by raising the patient high on the back rest, which is elevated to a 45-degree angle. The endoscopist works from the back of the bed over the patient's head.

Tracheotomy. — Under certain conditions tracheotomy may be life-saving, in that it allows repeated aspiration of the bronchial tree in patients whose debilitation is apt to be prolonged. This applies especially to feeble patients, after thoracic and abdominal operations, or patients with severe crushing wounds of the chest. Once tracheotomy has been accomplished, the nursing staff can keep the trachea and bronchi free from secretions by frequent aspiration. When needed, bronchoscopy may be performed through the tracheotomy opening. Proper humidity of the room air is a "must" for tracheotomy patients.

Aids to Coughing. — Preoperative education in coughing can bring real benefit to surgical patients. The postoperative patient with thick and abundant mucus must be encouraged to cough, but if his cough is to be effective he must be taught how to cough. The time for such instruction is before, not after, the operation.

Coughing is accomplished best by taking a slow deep breath, splinting the costal arches with the hands or elbows, and coughing quickly and sharply; a slow inspiration followed by a quick and forceful expiratory blast. Learning to close the glottis is important. When one has this in mind, he can feel it readily if he will contract the abdominal muscles at the end of inspiration. The slow deep breath, taken carefully, allows the lungs to expand to their fullest before expansion is cut short by the cough reflex. It allows the blast of air to get under the mucus, so to speak. The instructions to the patient are as follows;

1. Take a long deep breath slowly.
2. Close the glottis.
3. Contract the abdominal muscles.
4. Cough.

Coughing is performed best in the sitting position. One or two pillows doubled against the abdomen make an excellent support against which one can cough. The pillows are held with the hands and forearms while the elbows support the costal arch. Practicing this maneuver before operation will appear a blessing after operation.

Sometimes cough is restrained voluntarily because of pain from thoracic and high abdominal incisions. Procaine blocking of intercostal nerves offers an effective means of reducing this pain. It reduces the amount of general sedative required to relieve pain and thus lessens the depressing effect on the intrinsic bronchial eliminating mechanism that accompanies all heavy general sedation. A canvas rib belt is sometimes useful as a brace against which a patient can cough; the pain of coughing is less, the patient coughs more confidently and more vigorously. After a thoracic operation the rib cage can be stabilized by replacing a mobilized rib and securing it with wire or catgut sutures passed through drill holes in the cut ends of the rib. Adjoining ribs on either side of the incision can be lashed together with buried stay sutures. We prefer to leave the phrenic nerve intact after most thoracic operative procedures,

in order to retain an active diaphragm.

SUMMARY

The necessity for control and removal of bronchial secretions during the postoperative period is discussed. If the patient cannot cough effectively, his efforts at bronchial elimination must be assisted by aggressive use of the proper combination of pharmacologic, physical and mechanical methods. In this connection bronchial physiologic and dynamic aspects are presented. A plan for active treatment of the sequelae of stasis and plugging of the bronchi is outlined.

RESUMEN

Trata el autor de la necesidad de control y eliminación de las secreciones bronquiales en el período postoperatorio. Si el enfermo no puede toser facilmente, sus intentos deben ser ayudados por el empleo conjunto de métodos farmacológicos, físicos y mecánicos. En relación con este tratamiento se estudia la fisiología y la dinámica bronquial. Finalmente se bosqueja un plan para el tratamiento activo de las secuelas de la estasis y la obstrucción bronquial.

RIASSUNTO

Viene messa in rilievo l'importanza di controllare e aspirare le secrezioni bronchiali nel periodo post-operatorio. Quando il paziente non riesce a tossire efficacemente deve essere assistito in questo sforzo con metodi farmacologici, fisici e meccanici. Vengono trattati a questo proposito gli aspetti fisiologici della dinamica bronchiale e i criterii per una attiva terapia della stasi e dell'ingorgo bronchiale.

ZUSAMMENFASSUNG

Die Notwendigkeit der Kontrollierung und Entfernung von Bronchialsekreten im postoperativen Stadium wird erörtert. Patienten, die nicht kräftig genug husten können, müssen in ihren Bemühungen, die Bronchialsekrete auszuwerfen, durch energische Massnahmen pharmakologischer, physikalischer und mechanischer Art unterstützt werden. In diesem Zusammenhang werden die Physiologie und die Dynamik des Bronchialsystems dargestellt. Ein Plan für die aktive Behandlung der Folgen von Sekretstauung und Verstopfung der Bronchien wird entworfen.

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Statues of the Egyptian gods Bes and Phtah are accurate figurations of achondroplasia.

Extract from the Journals of St. Bartholomew's Hospital, London: "April 28th, 1707. Ordered that the room over the cellar where the matron sold beer and ale be made a ward."

—*Hamilton Bailey, F.R.C.S. (Eng.), F.A.C.S., F.R.C.S. (Edin.), F.I.C.S. (Hon.)*

Sección en Español

Tomografia en General, Tomografia Renal y Tomografia del Coledoco

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LA mayor parte de los problems clínicos en donde es necesaria la cooperación radiológica, se resuelven a base de exploraciones hechas por el especialista radiólogo, utilizando las radiografias simples, estereoscópicas, etc., según los métodos clásicos. Pero en algunos casos no excepcionales por cierto, hay dificultad para ver con claridad determinadas estructuras anatómicas, en las regiones donde se superponen sombras difíciles de disociar, aún interpretando correctamente y aunque las radiografías en varias posiciones sean impecables en su técnica, en estos casos está indicada la tomografía.

Definicion: Se llama tomografía a un tipo especial de radiografía en que se registra una sola sección de una parte del organismo sin que se proyecten en la película con claridad, más que las estructuras de dicho plano y solo en forma confusa las situadas adelante y hacia atras del mismo.

Importancia de la Tomografía: Se deduce de la definición—que la tomografía es interesante en radiografía pulmonar, costillas, parte alta de la columna cervical, cráneo, rótula, articulación temporo-maxilar, laringe. Está en estudio la tomografía visceral.

Síntesis Histórica: Los nombres de Bocage, Vallebona, Ziedses des Plantes, Sherwood, Moore, Fieffer, Grossmann, deben citarse en la historia de la tomografía, pues el primero de la Escuela Francesa, fué el autor de los famosos postulados en que se basan los procedimientos de este tipo de radiografía seccional actualmente y construyó un aparato especial para practicar este tipo de radiografía. Las investigaciones y estudios de Bocage datan de 1917 y los estudios de otros investigadores son posteriores (1,922- 1,928- 1,929- 1,930- 1,934- 1,935), en que se construyeron equipos especiales con funcionamiento diferente para hacer tomografías.

La radiografía seccional tiene un mecanismo especial que consiste en que el tubo y la placa se mueven paralelamente y en sentido inverso durante la exposición, por el contrario de lo que sucede en la radiografía habitual, en que el rayo central proviene de un tubo quieto sin movimientos y lo mismo la película. En la radiografía seccional el centro del movimiento que en sentido inverso se produce en el tubo y en la placa está precisamente a nivel de la región interesante, de la sección importante, que es la que sale clara en la radiografía, es una especie de pibote o de centro en torno del cual se verifica el movimiento, es por allí por donde pasa el rayo central.

Los postulados de Bocage, base de la tomografía son 3, que tomo del artículo

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de Jean Kieffer y que dicen:

1. El tubo y la placa se mueven recíprocamente en lineas rectas, siguiendo planos que son paralelos entre sí.

2. El tubo y la placa se mueven recíprocamente en circulos, cuadros, cruces y espirales de Aquímedes (hélices), siguiendo planos paralelos entre sí.

3. El tubo y la placa giran recíprocamente alrededor de un eje que queda en el plano del cuerpo por registrar.

En estos tres principios se basan los aparatos que se usan corrientemente y los procedimientos que se llaman planigrafía, tomografía (Chaoul), estratigrafía, vertigrafía, laminografía; son métodos diferentes sólo en detalle, en su mecanismo, pero todos conducen al mismo fin, hacer radiografías seccionales.

Nosotros hemos utilizado para hacer nuestras radiografías el Selectoplano Keleket, que se adapta al aparato de Rayos X, con un soporte especial, este tipo de tomógrafo puede ser movido por motor y en forma automática o bien a mano. Lo interesante es entrenarse en su manejo, pues una vez que el técnico se ha familiarizado con las maniobras, el problema de la radiografía seccional se hace sencillo y bastan unos cuantos minutos para dejar listo el aparato su funcionamiento, los mismo minutos que se utilizan para desarmarlo.

El selectoplano trabaja en posición horizontal, siendo utilizable para la mayor parte de las radiografías, aunque en tomografía pulmonar tiene ciertas ventajas la posición de pie, por demostrar las cavernas con niveles. La posición horizontal permite en cambio mayor fijeza del enfermo, además, el selectoplano es una adaptación poco costosa y es ésta su principal cualidad, permitiendo hacer buenos estudios generales sobre tomografía. Hemos adaptado un equipo United Electric, para tomografía vertical.

Enfocamiento.—En el Selectoplano el enfocamiento o más bien dicho, sus resultados son parecidos a los que produce la acción focal de las lentes, por medio del enfocamiento resultan más claras ciertas regiones en determinado plano o foco, zona que se desea estudiar, quedando eliminadas tanto las partes que están delante como atrás del plano focal (efecto confuso). Como los Rayos X no se polarizan, ni se reflejan, por medio de lentes o espejos, el enfocamiento se lleva a cabo dando movimiento al tubo y a la película. Este movimiento simultáneo se hace por medio de mecanismos especiales, eslabones entre el tubo y la película, de tal manera que el haz central de los Rayos X se encuentra enfocado en el centro de la película.

En el Selectoplano, el movimiento que se produce en el mecanismo es recto lineal, mientras el tubo se desliza en un sentido, la película lo hace en sentido opuesto, colocada en el Potter que se mueve a lo largo de la mesa. Este movimiento se hace con el motor del Selectoplano o con la mano.

Aunque el Selectoplano no es un aparato perfecto, permite hacer buenos estudios radiológicos, pudiendo usarse placas de cualquier tamaño y posiciones variables, pero no vertical, éste es un inconveniente.

Se pueden obtener radiografías, de medio centímetro a medio centímetro de profundidad, desde uno hasta 20 centímetros, pero la tomografía no se puede controlar fluoroscópicamente, como en los tomógrafos de otro tipo, el gastro de placas es pues, mayor aunque disminuye con el entrenamiento del técnico. Permite resolver con sus características, mecánicas, la mayor parte de los problemas que se presentan al Médico.

La rigidez que es una cualidad en los tomógrafos, no es perfecta en el Selectoplano, hay vibración, pero poca; el ideal sería que no la hubiera para que el haz de Rayos X, saliera de un punto del tubo,

dando una sombra nítida, a base de movimientos suaves y uniformes, tanto para el tubo, como para película, evitando que se muevan los puntos que corresponden a la sección del cuerpo por estudiar. El soporte del tubo en el Selectoplano es bastante sólido y evita parte de la vibración (rigidez).

Los movimientos se hacen a través de una varilla de fierro, que por un extremo se conecta con el carro del tubo y por la otra con el Potter, por medio de eslabones especiales.

Los tiempos de exposición en la tomografía son variables. Uno va conociendo las técnicas y modificándolas, a base de experiencia. La mayor parte de mis tomografías han sido obtenidas con un segundo o dos de exposición. El voltaje es un poco mayor que en radiografía rutinaria, pero es siempre un factor variable. Respecto a la profundidad, también es distinta según el órgano que se trata de estudiar. Por ejemplo: el pulmón puede ser estudiado a distintas profundidades, lo mismo la laringe, pero hay una profundidad ideal en la que la parte por radiografías sale muy clara. El problema es dar rápidamente con esta región, para gastar poco material. Este es un punto difícil que solo lo resuelve el Equipo en parte, pero principalmente la experiencia del Radiólogo.

Las indicaciones de la radiografía analítica, pues la tomografía no es otra cosa, son muchas, pues a cada momento la superposición de estructuras hace difícil la interpretación, en muchas regiones del organismo y así por ejemplo, cuando no resulta fácil demostrar la anatomía de la región mandibular, con la radiografía corriente se recurrirá a la tomografía.

Las indicaciones para la tomografía pulmonar han sido establecidas mas cuidadosamente y alguien ha afirmado, que un examen radiológico de pulmones no es completo sino se recurre a la radiografía analítica. Es exagerar, muchos casos, la mayoría son resueltos por el examen rutinario, pero la radiografía analítica tiene indicaciones principalmente para establecer o rechazar el diagnóstico de cavidades dudosas.

Despues de las operaciones, como las plastías, la radiografía analítica precisa con exactitud las condiciones anatómicas del pulmón, lo que representa una gran ventaja para el clínico y el cirujano.

A veces la tomografía demuestra un padecimiento, cuando la radiografía rutinaria había declarado sana a la persona objeto del examen.

En casos en que un espesamiento pleural o una zona de hepatización no permita hacer un estudio minucioso del estado del pulmón por cubrirlo la opacidad, la radiografía analítica puede resolver el problema.

Así la radiografía analítica a grandes rasgos es útil para precisar detalles, en los casos de neumotorax, en los hemitorax que han sufrido intervenciones, en el estudio de los muñones pulmonares y su contenido.

En posición de perfil la tomografía al estudiar los órganos en cortes permite sacar conclusiones útiles estudiando determinado segmento, que en la radiografía común queda cubierto por el otro pulmón.

Hay problemas que preferentemente serán resueltos por la broncografía y no por la radiografía analítica. Así las indicaciones de radiografía simple, penetrante, tomografía y broncografía serán la consecuencia de un estudio profundo y minucioso del enfermo.

Lo mismo se puede afirmar de la tomografía en otras regiones por ejemplo en laringe. Lo primero que se necesita es familiarizarse con el procedimiento con su interpretación. Conocida la técnica y la radiografía lateral, teniendo presente la anatomía radiológica del órgano se puede llegar a interpretar con fidelidad. Se

demuestran principalmente procesos neoplásicos, parálisis, procesos tuberculosos, etc. Pero tanto la técnica como la interpretación requieren un entrenamiento largo y paciente, esto mas necesario que un equipo costoso, aunque si se tienen las dos cosas, los resultados serán mejores.

Nuestro trabajo es general. Tiene como fin presentar algunas tomografías importantes, para que sirvan de base a la difusión del procedimiento que se ha hecho en pulmón (trabajo de Aladro), en laringe, pero no ha aparecido un trabajo sobre tomografía general.

La observación cuidadosa de las tomografías hará que la radiografía analítica que nos ocupa llegue a ser un método de precisión en el diagnóstico de muchos padecimientos.

En trabajos posteriores, detallaremos con minuciosidad la técnica e indicaciones de cada uno de los tipos de tomografía.

Actualmente se practica:

a) En pulmón, con resultados excelentes.
b) En laringe, sus resultados son excelentes.
c) Articulación temporo maxilar, resultados muy buenos.
d) Tomografía de rótula, buenos.
e) Tomografía de costillas, excelentes.
f) Tomografía esternal, resultados buenos.
g) Cráneo, muy buenos.
h) Columna, algunas indicaciones.
i) Visceral (riñones, vesícula, etc.), es prometedora, mejorando el equipo y el material humano (técnicos). En riñon muy buenos.
j) Tomografía en cardiovascular, buenos.

Instrucciones para el Manejo del Selectoplano
(Tomadas de "Keleket" folleto).

(Etas instrucciones detalladas se dan como referencia para ayudar a la instalación del Selectoplano por primera vez. Una vez que el operador se ha familiarizado con la rutina, la mesa y el soporte del tubo se pueden arreglar para radiografía seccional en unos cuantos minutos.)

1. *Pongase la Mesa en Posición Horizontal.*
   La mesa fué cuidadosamente nivelada al instalarla y debe estar en posición horizontal para la radiografía seccional.
2. *Montese el Aditamento del Selectoplano.*
   a. Móntese el riel en la mesa.
   b. Insértese el soporte-guía inferior en su canalaruda que tiene el estuche del Bucky.
   c. Póngase y apriétese el soporte-guía superior en el brazo horizontal del soporte del tubo.
   d. Introdúzcase el soporte con el índice de "profundidad," deslizándolo sobre el riel que se ha colocado en el borde de la mesa.
   e. Muévase el soporte del tubo, el Bucky y el soporte con el índice de "profundidad" hasta que esten en una misma línea vertical.
   f. Métase el pivote del brazo-guía (que transmite el movimiento del tubo al Bucky), en la entrada que para el caso tiene el soporte de "profundidad" y deslícese haciéndolo entrar en los soportes-guías inferior y superior (que se han colocado en el Bucky y en el soporte horizontal del tubo), de tal manera que corra entre las carruchas.
   g. Apriétese el pivote ya en su lugar.
3. *Aflójense Estos Tornillos.*
   a. Aflójese la palanquita que fija el movimiento del Bucky y que está colocado al frente, dejándole así libre movimiento al Bucky.
   b. El tornillo que aprieta el eje del tubo y que le permite angulación longitudinal.

c. La manija que permite movimiento longitudinal al soporte del tubo sobre sus rieles.
d. La manija del movimiento vertical estereoscópico del tubo para aflojarla rótese hacia el extremo de la "cabeza" de la mesa.

4. *Apriétense Estos Tornillos.*
a. El cierre que permite "altura" en el soporte del tubo.
b. El cierre de rotación de la mesa.
c. El cierre del movimiento transversal.
d. Los cierres del soporte de "profundidad" (apriétense despues de centrar al enfermo).

5. *Céntrese el Paciente.*
La parte por examinar debe céntrarse en la línea central longitudinal.

6. *Céntrese el Selectoplano.*
a. Muévance el soporte de profundidad, el soporte del tubo y el Bucky hasta la región que se desea.
b. Céntrese cuidadosamente el soporte de "profundidad," tanto longitudinal como verticalmente.

7. *Apriétese el Soporte de "Profundidad."*
a. Apriétense ambos botones para fijarlo y no permitir su movimiento longitudinal.
b. Apriétese el botón que previene el movimiento vertical.

8. *Aliniense el Brazo Soporte-Guía y la Columna del Soporte del Tubo.*
a. Muévase el soporte del tubo longitudinalmente hasta que éste y el brazo-guía (palanca) queden paralelos.
b. Véase que los cierres descritos en (3) estén flojos.
c. Véase que los cierres descritos en (4) estén apretados.

9. *Ajústese el Cable-Guía.*
a. Véase que el diafragma Bucky no esté cerrado.
b. Apriétese el botón del selectoplano (el de explosición), para darle energía al motor.
c. Suéltese dicho botón cuando la marca roja de la barra-riel llegue al indicador colocado en el riel superior.

10. *Conectese el Soporte del Tubo a la Varilla-Guía* (la que imprime el movimiento).
a. Sáquese la cinta métrica hasta que su extremo llegue al indicador que está en el riel superior.
b. Sujétese la cinta y muévase la columna del soporte del tubo hacia el extremo de la "cabeza" de la mesa, hasta que el extremo de la cinta coincida con la marca roja de la varilla guía.
c. Póngase la varilla-guía en el clamp del cable y apriétese el botón para fijarlo.
d. Guárdese la cinta métrica en su caja.

11. *Arreglese el Diafragma Potter Bucky.*
a. En el "timer" del Bucky márquese un poco más del tiempo que va a ser la exposición.
b. Cárguese y prepárese el Bucky.
c. Ajústese el Kilovoltaje, el miliampejraje y el tiempo de exposición en el control (la exposición se controla con el "timer" principal).

12. *Apriétese el Boton de Exposición del Selectoplano.* La exposición se hace automáticamente, en los siguientes tiempos:
a. Al apretar el botón de exposición se da energía a un "relay" el cual a su vez arranca el motor (si se afloja el botón de exposición ésta se suspenderá en cualquier momento).
b. Cuando el cable que transmite el movimiento ha desplazado al soporte del tubo hasta su límite en el extremo de los "pies" de la mesa, un suitch se cierra automáticamente para disparar el Bucky por

medio de un magneto.

c. El Bucky con sus contactos cierra el circuito del "timer" principal y de esta manera se hace la exposición. Si el Bucky no está preparado no habrá exposición. Si se lo ha dado menor tiempo al Bucky que al "timer" principal del control, el Bucky interrumpirá la exposición.

Radiografía Convencional (De Rutina).

Para quitar los aditamentos del Selectoplano, inviértase el procedimiento sequido para su instalación.

1. Aflójese el clamp del cable y sáquese de él la varilla-guía.

2. Muévase el soporte del tubo hasta alinearlo con el Bucky y con el soporte-guía del Selectoplano (el marcador de "profundidad").

3. Aflójese la palanca que aprieta el pivote del brazo-guía (colocando este pivote por lo menos a unos 10 cms. arriba de la mesa con la manivela que sirve para seleccionar la "profundidad").

4. Sáquese el brazo-guía (la palanca) del orificio donde está metido su pivote y de los soportes-guía superior e inferior, al mismo tiempo.

5. Sáquese el soporte-guía inferior, del estuche del Bucky.

6. Sáquese el soporte-guía superior si se desea.

7. Aflójese y sáquese el soporte marcador de "profundidad," deslizándolo en el riel de la mesa.

8. Quítese el riel de la mesa (si se desea).

La Tomografía Renal.—La tomografía renal es un método sencillo y de gran precisión para demostrar el contorno del riñón. En la radiografía simple ya se observa este, pero con la tomografía se precisa mejor, aún en los casos en que no se ha inyectado medio de contraste intravenoso. Si se combina con el neumoriñón los resultados pueden sencillamente ser excelentes, pero ello no es necesario según lo demuestran nuestros casos, aunque es posible que en algunos enfermos sea util esta asociación. La tomografía por otra parte vuelve inútiles técnicas complicadas, que necesitan punciones y producen intensas molestias a los pacientes aparte del temor que causa cualquiera intervención por pequeña que sea. Claro está que la tomografía no substituye, ni lo pretende a la urografía, sino que se asocia con ella cuando es deficiente por presencia de gases, sea descendente o ascendente, tampoco substituye a la molesta y excepcionalmente necesaria arteriografía, es solamente un método mas de exploración, pero de gran importancia para la interpretación puesto que precisa el contorno a distintas profundidades en ambos riñones, haciendo visible sobre todo el riñón izquierdo, que por la presencia de gases en estómago, transverso, ángulo cólico, etc., es mas difícil de ver, y el que padece mas frecuentemente según nuestras observaciones. La tomografía por lo tanto es interesante para el diagnóstico de los tumores renales, que deforman el contorno, para precisar el tamaño y posición del riñón, teniendo la ventaja de que puede practicarse de frente y perfil, aunque nuestra escasa experiencia se refiere a radiografías de frente en antero posterior con el enfermo en decúbito dorsal. Pero la tomografía puede practicarse aún para precisar anatomía de pelvis y cálices renales, de ureteres y vejiga, obteniendose imágenes menos detalladas que con la radiografía común pero mejor contrastadas. La imágen del Psoas, del borde hepático y del bazo es frecuentemente visible, pues la tomografía tiene la enorme ventaja de establecer diferencias de contraste entre tejidos blandos lo que no logra habitualmente la radiografía común, aún estereoscópicas. Creemos además que puede hacerse tomografía estereoscópica, mejorando la técnica.

La tomografía renal es mencionada en el Manual de Tomografía de Weinbren, pero en forma superficial y el artículo se ilustra con radiografías un tanto deficientes técnicamente. Nuestras placas también lo fueron y algunas lo son, pero el entrenamiento del Radiólogo ha hecho posible a traves de la experiencia de varios años mejorar el detalle y el contraste perfeccionando la técnica y así hemos obtenido algunas placas bastante buenas como para servir de estímulo para continuar nuestro estudio.

Presentamos en este Congreso de Radiología varios casos de tomografía, en primer lugar porque creemos que el conocimiento y difusión de la tomografía renal puede contribuir a mejorar el diagnóstico radiológico, en segundo lugar por la deficiencia frecuente de la urografía descendente cuando hay gases y por otra parte porque no se han presentado trabajo radiológicos en relación con el tema tomografía. El conocimiento mas profundo que nos de la experiencia permitirá en futuro interpretar mejor las exploraciones tomográficas y quizá este estudio sea motivo tomado en serio para equipar con el tomógrafo los Servicios de Urología.

Tecnica de la Tomografía Renal: Nosotros tenemos solamente alguna experiencia en placas anteroposteriores. Hemos usado un aparato de anodo giratorio, cuatro valvulas, foco fino. Pantallas par Speed Patterson. Distancia de 36 pulgadas en posición horizontal, con 75 miliamperios de intensidad y un tiempo que varía entre un segundo a dos, con unos 60 a 65 kilovoltios, según sea el grueso del enfermo. Los resultados han sido buenos en general, y creemos que con entrenamiento técnico las radiografías mejoren.

En lo tocante a la interpretación prácticamente es la misma que en la urografía.

Pueden tomarse tomografías de pie para demonstrarse la Ptósis renal.

El tamaño de las placas varía, pueden obtenerse en 14 × 17, pero es mejor tomografías mas localizadas a una zona mas chica, por ejemplo la placa 11 × 14 ó 12 × 15. Para la vejiga 10 × 12.

Generalmente tomamos una placa simple del tracto urinario en 14 × 17. Luego la primera Urografía usando Urokon, Pyelectan o Nosylan según el caso, a los 5 ó 10 minutos de la inyección, después otra urografía e inmediatamente después de dos a cuatro tomografías a distintas profundidades, de 6 a 9 ctms. generalmente, por último una placa urográfica general de 14 × 17.

Total unas 8 placas lo máximo, a veces seis solamente, con esto ha sido suficiente para resolver prácticamente todos los casos.

La tomografía debe practicarse dados sus resultados, en la exploración rutinaria del tracto urinario, a veces para la vejiga exclusivamente, cuando la cubren gases. Los resultados siendo excelentes.

Tomografía del Colédoco y Vesícula.—Importancia: En la exploración de vesícula, la mayor parte de los problemas los resuelve la colecistografía oral, con Telepaque o productos análogos, pero cuando hay superposición de gases o dificultad para visualizar el órgano, la radiografía seccional se vuelve importante. Por lo que toca al colédoco, hacemos notar que la tomografía solamente la hemos practicado como complemento de la Colangiografía Intravenosa porque nos hemos dado cuenta, de que el estudio tomográfico mejora el debil contraste de la colografina o biligrafina intravenosas.

Técnica: La mismo posición que para la radiografía común, el tomógrafo se enfocará en el plano 7 y próximas profundidades para el colédoco, según lo grueso del sujeto enfermo. Para la vesícula el plano es mas superficial estando el enfermo boca abajo y de preferencia en oblicua izquierda anterior. El entre-

namiento del técnico es muy importante, para localizar rápidamente el plano ideal. Tanto el colédoco como la vesícula salen muy claros en bastante casos, aunque no pueda afirmarse que sea un procedimiento que resuelva totalmente los casos dudosos pero contribuye a hacer los diagnósticos mas precisos, haciendo que las vías biliares se vean mejor. Los tiempos de exposición y el voltaje son mas o menos iguales para colecistografía y colédoco, un poco mas altos que en radiografía normal. La tomografía debe ser un tanto instantánea. 75 miliamperios, un segundo y una distancia de 36 pulgadas son factores que se deben retener en la mente, el voltaje siendo variable según los grueso del enfermo.

Indicaciones: Los casos en que la radiografía común no resuelve el problema y en todos los enfermos en que se practique la colangiografía intravenosa.

RESUMEN

Se presenta un trabajo sintético sobre tomografía y se precisan las indicaciones de la radiografía seccional. La radiografía analítica tiene interés, en los niños y en los adultos, en los casos en que se pretenda precisar el contorno del riñon. Puede asociarse al neumoriñon o practicarse en forma independiente. En general se basta por si sola. Completando los resultados de la urografías descendente y ascendente, cuando estas son deficientes por la presencia de gases. Es muy precisa para el diagnóstico de ciertas tumoraciones, litiasis y otros padecimientos. Así pues, la tomografía tiende a extenderse como método de auxilio en casos de padecimientos de esqueleto, pulmón, laringe, articulaciones. En abdomen se precisan las indicaciones de la tomografía renal y además se menciona y se describe la técnica e indicaciones de la tomografía del conducto colédoco, que aparece más claro en las tomografías obtenidas después de la inyección de "Biligrafina," que en aquellas que se obtienen en forma simple. El colédoco se ve más bien contrstado y se facilita la interpretación de litiasis, o dilataciones de la vía biliar principal. Se presentan en forma comparativa radiografías obtenidas con la técnica habitual y placas hechas con el tomografo adaptado a un aparato de rayos X común, percatandose el observador de la gran superioridad del método tomógrafico. En la prática deben asociarse los dos procedimientos, para la obtención de mejores resultados.

Debe tenerse presente que las mejores tomografías del colédoco, se obtienen en decubito ventral, oblícuo, como para la tomografía de la vesícula biliar.

Baron Larrey, Surgeon-in-Chief to the Napoleonic armies, relates in his Memoirs that after the battle of Brezina he lay in bed too exhausted for sleep, for on that day he had performed more than two hundred amputations.

—Hamilton Bailey, F.R.C.S. (Eng.), F.A.C.S., F.R.C.S. (Edin.), F.I.C.S. (Hon.)

Editorial

When the Doctor Goes to Court

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WHEN the doctor goes to court, what happens to him should not happen to a dog. He comes as an "expert witness" to prevent the miscarriage of justice, as a humanitarian, seeking no advantage, expecting no gain, at the sacrifice of his precious energy and valuable time. And no sooner does he step upon the witness stand than the mantle of Elijah and scepter of authority, dearly paid for and rightly his, are torn from him and turned into a "cloak and dagger" with which to bind and knife him. I speak from experience.

He becomes a prisoner in the dock, not permitted to leave for duty until the opposition is finished with the inquisition. As far as the court of justice is concerned, "death takes a holiday." The lawyer must win a case.

The brutal technic employed against the doctor by the opposition runs a course predictable to the experienced. First, to implant into the jury's mind a doubt as to the doctor's integrity, the doctor will be coarsely asked how much he is getting paid for testifying. Second, to implant into the jury's mind doubt at the doctor's adequacy, he is pummeled only with scientific questions away from his field; he is asked compound, complicated questions that demand a detailed discussion for an answer, but he is immediately threatened with "contempt" unless he answers with one word, "Yes" or "No," neither of which can possibly be interpreted as an intelligent reply.

The doctor is badgered, bullied and shouted down, impudently harassed, pushed against a wall, and finally accused of bearing false witness, of lacking medical knowledge and therefore being unfit for his trade, and of harboring prejudice in favor of the claimant or fellow-physician whom he came to assist.

His dignity destroyed, his honor questioned and his ability doubted, the doctor's famed equanimity becomes a jest for court jackals. The effect upon the doctor, after three hours of brain-washing, is to render him totally miserable and uninterested in the entire proceeding, his only thought that of escape—submission to the will of the opposition.

Why? Because a small group of members of the legal profession have found that suing the doctor has brought them fabulous financial success. Their weapon is a new legal concept called "the more adequate award."

This concept, pushed on a wide front, through books, articles and "seminars" for attorneys in many parts of the United States, has brought upon the medical profession a locust-plague of malpractice suits never before witnessed in the history of medicine. And although one attorney may admit in an article that he has been warned of the grave danger of these tactics both to medicine and mankind, he pooh-poohs these warnings with an assertion that the "six-figure awards" which he and his colleagues are winning from the doctors' insurance companies is only the beginning. He envisions an immediate

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future when "the sky is the limit."

In an article distributed to 150,000 doctors, he boasts of legal moves by means of which the doctor and specialist can be tricked into giving the desired testimony. "Rush him into court . . . Make him a layman by means of a $2.00 subpoena . . . and the doctor must join the common herd . . . Make him angry . . . he can be urged into expert testimony . . . Some courts now permit experts of any school to testify, the plaintiff's lawyer may enlist the expert help of psychologists, toxicologists, and yes, even of chiropractors."

I am not here, gentlemen, to blame the entire legal profession for the actions of a few of their members. I have the utmost respect for the legal profession and enjoy the friendship of many of the top-ranking attorneys in our community, who will attest to my honor, and my cooperation in court, when it is necessary for me to appear. But, since neither organized medicine nor the legal profession are doing anything about this menace, I feel that it is up to the individual doctor to learn how to protect himself from injustice in court.

This paper, to aid the doctor in court, is based upon twenty years of personal experience on the witness stand as an "expert" at the mercy of the attorneys, some of whom use him and abuse him for their own personal gain.

The doctor needs this aid very sadly, for the most astute student of medicine is no match for the least competent lawyer in court.

The lawyer's business is cunning; whereas the very nature of the doctor's training and calling dooms him, in advance, for a downfall in court, when he is called upon to testify in behalf of a disabled patient or a maligned fellow physician.

I gradually discovered that I was bringing for a weapon only my sense of justice to an arena where no holds are barred. For that is the rule of the game.

I had to learn that I was coming not to a court of justice, but, for the sake of justice, to a court of law. I had to learn that it was a game, and that the rules of the game must be learned from the lawyer; namely, copy his behavior, allow yourself the privileges toward him that he takes toward you; match him weapon for weapon.

When the lawyer goes into a Clarence Darrow act to win the jury, leading them and you away from the issue, match him a bit in drama, and yank him back to the center of the ring—where he cannot butt your head against a post.

You can do this if you remember it is a game; no one is playing for keeps. When he meets you outside the courtroom, the opposing attorney will greet you with the utmost deference, and perhaps mean it. When he lashes out at you in the courtroom, immediately thereafter, and tries to cut you to ribbons, do not be surprised. That is one of the rules of the game. Do as he does—"Shake hands and come out fighting."

But you cannot fight unless you learn the most important lesson of all; namely, contrary to the doctor's belief, the attorney is playing the doctor's game in court, but with his own rules. On guard, you can play the game with him and acquit yourself well, because he is talking *your* language—medicine.

By sheer impudence, which one can admire, the attorney is cleverly maneuvering the doctor toward defeat upon his own home ground. If an attorney can learn a sufficient amount of our language to serve him on a medical case in court, sufficiently to enable him with arrogance to dispute our diagnosis, our treatment and prognosis—can we not learn a few rules of *his* game?

If you will keep in mind that every time

a malpractice suit is won against a doctor, a hundred other suits are filed, you will realize that going to court is as important to your profession as it is to the lawyer's pocketbook. Assured of this, you will not consider it beneath your dignity to ape the attorney's methods; to learn his rules. You will stop looking upon this practice with half tolerance and half anger; you will see it for what it is—defamation of our profession; an evil which must be done away with.

Don't Bear False Witness.—Don't permit a foolish or greedy patient to induce you to make any statement that is not entirely true. (Sufficient unto the day be the evil thereof when we must go to court to protect one another.) A feeling of justice will enable you more easily to outface the cheeky attorney.

The doctor has become an under dog. Being easily able to outface and crush him in court, the lawyer becomes more and more brazen and goes a step further. Many current journals now carry articles by brave lawyers who wish not only to teach the doctor his trade but to dictate his fees.

Is it not enough that the doctor must fight colleges, boards and hospitals for permission to practice; is it not enough that he must compete with insurance medicine, industrial medicine, group medicine and the threat of State medicine? Does he have to be dragged to court, like a sheep to slaughter, to be stripped of his dignity, which must lose him the respect of the public? Everyone seems so willing to throw the doctor to the dogs.

Not only does the public need faith in the doctor, it needs faith in the medical profession as a whole. This faith receives a blow every time a malpractice suit is lost by a brother physician.

And, since the legal profession permits this criminal abuse, and defamation in public of the most needed of human beings, the doctor, it is up to the doctor to learn how to defend himself in court. In old Austria, one of the most important subjects in the curriculum of any profession was fencing. So important was this art of defending one's honor that many a fine man came to a physician, requesting a surgical scar be made on his face, as proof of having studied the art. Dear brother doctor, learn to fence in court, with tongue sharper than foils.

I do not of course speak to the exception, the untrained, the unqualified and the unlicensed physician—if physician he may be designated. And I do not speak to the group that I call "collaborators" of the attorneys—medical men who work for the insurance companies, seeking to defraud a claimant instead of practicing their profession. These paid agents, experienced in the art of glibness, who come to court piously wearing for a coat the parchment of Hippocrates, are part and parcel of the whole setup when the doctor goes to court.

I speak of the doctor, the healer, the physician, the man who stands for superhuman hours at a time in the operating room in order to prolong a life; who forgets to eat while at a bedside; who has no time for adequate sleep because a human being is about to pass beyond the horizon. I speak of the doctor who is considered by humanity less than human.

The doctor needs no lawyer in the court of justice to teach him humility. The study of medicine attends to that very adequately, and the practice of this art finishes the job. I know of no other human being who strolls, waddles, sprints or dashes through life so apologetically as the doctor. The doctor is always apologizing somehow. When young, he is constantly apologizing to his parents for the slim return on their investment; to relatives of patients for not having made the dead walk; to hospital superintendents for

youthful generosity to a clinic charge; to bill collectors, or to pretty nurses for not pushing a door open for them soon enough.

When older, he is perpetually apologizing to patients for keeping them waiting; for expecting a fee for his services—after all, is not the doctor akin to a minister, a man of God? Lo, the poor doctor must apologize to his wife for being habitually late to dinner, for walking out on her guests, for leaving her alone in the theater in the middle of the performance. He must apologize to his children for lack of leisure to get acquainted with them; he must apologize to the lay hospital board for insufficient donations to his favorite institution; to surgical supervisors for expecting the proper instruments needed for his operation. Until at last he apologizes to St. Peter for dropping dead of a coronary attack in his 40's, and so impeding traffic at the Pearly Gates.

Fellow physicians, are we mice or are we men when we go to court? Unaccustomed to court rituals, the arrogant, robed judge freezes us with unnamed, childish fear; the breezy, seemingly conscienceless attorney paralyzes us with his bee-sting of impudence. He is so at home in court.

Instantly stripped of respect and unquestioned authority due us, the doctor quite naturally feels completely unarmed before the enemy.

But the emotion is purely psychological, without the basis of fact. It is the opposition who is unarmed. The attorney is bluffing from start to finish. He is the Brooklyn cowboy with blank cartridges. It is the doctor, if he but knew it, who has live bullets in his six-shooter. For if the truth was all that was being sought, there would be no need for lawyers at all. A jury of peers would meet, hear out the story from both sides, and have a quick decision.

The opposing lawyer is in court for the sole purpose of making money. It is because the attorney knows the chinks in his own armor that he sets out on a vicious and tiring campaign to wear the doctor down before he can calmly evaluate his position. The doctor, pushed against the wall, loses his assurance and cannot answer calmly. Seemingly, the machinery of a court of law is set up to the attorney's advantage. When the attorney finds himself stymied, he has the privilege to ask that court be adjourned until a hopeful tomorrow. A witness has not that privilege. He is a prisoner. Whatever he feels, believes and knows, he must express now—or forever after hold his peace.

Therefore, the doctor must remember who he is, why he is in court. It would be well for the doctor to sustain a just anger in his heart, remembering what a day in court costs him, in dangerous personal effort (mental tension and heart strain), plus neglect of patients. Just anger, the right that even the Bible grants an honest man, will dictate self-control and hard, clear thinking.

At the end of a day in court, the doctor brings home a lost day and a high blood pressure. When the doctor has aided a claimant in winning a sizeable sum, what is his compensation? A hundred in Confederate money. While the lawyer whom he aided gets thirty-three to fifty per cent of the patient's winnings.

The doctor is on the losing end either way, with his side as well as with the opposition. There is no need for him to be the loser all around and drag home sans dignity, sans victory and sans vengeance.

You do wear the mantle of Hippocrates. Do not let a lawyer strip it from you publicly. Rather, when necessity commands, take it off yourself, roll up your sleeves, "bless the caduceus and pass the ammunition."

I would rather be reprimanded by a judge than bullied by the tallest lawyer in

Beverly Hills. So step over into the jury box, more or less; address the lawyer man to man; address the judge as gentleman to gentleman. You have every right to address the court when abused. For instance, "Do I have to answer that, regardless of truth? His questions are not intelligent."

Q. "How much are you getting for coming to court, doctor?"

A. "A hundred dollars—for trying to help one human and neglecting my practice. How much will you get, Mr. Attorney?"

You will be reprimanded by the Court, the attorney will violently object, but you will have made your point and acquitted yourself well.

It is high time we put a stop to this disgraceful imposition upon us by a group of men who use us and abuse us for their own personal gain. When you go to court, see to it that the whole legal profession learns to respect you as the quick finger on the trigger, as well as on the pulse.

Malpractice Suits. — Malpractice suits against qualified doctors are legalized blackmail.

Every step we take in life bears a calculated risk.

For so many baths taken daily, a certain number will step into the bathtub or shower and break a rib or a limb.

For so many trips to Aunt Martha's, during holidays, there will be a certain percentage of accidents.

We have actual estimated statistics of probable deaths during a holiday period before the holiday arrives. For example, it has already been estimated that by the end of this year 40,000 innocent persons will have been slaughtered on the highways. Why not sue the automobile industry?

Has anyone ever thought of suing the good Lord for the untimely death of a loved one?

Just as sacrilegious and absurd is it to talk of suing a doctor for having vainly tried to save a life or improve a pathologic condition.

Every surgical procedure necessarily carries some element of risk.

The patient is made aware of this, and must sign a permit before a doctor can operate.

Every patient has the freedom and privilege of investigating the character and ability of his doctor before accepting surgical care at his hands. The average person does so before accepting surgical treatment for himself or for a helpless or younger member of his family.

The doctor is the only human being among us who has given half his life span to learning the skills that enable him to try to prolong a life or save it. Would the public wish to discourage the doctor from trying?

The public must be reminded that many a seemingly normal person suddenly drops dead of a heart attack while performing a habitual daily chore. Many a person drops dead of a heart attack ten minutes after an electrocardiograph has recorded a perfectly normal heart.

By the same token, a patient will occasionally suffer a like misfortune on the operating table, through no fault of the doctor's. Life in the human body is the great mystery, and medicine is not a mathematical science.

If the public knew how brutally every medical student and every doctor is screened, sifted, kneaded and pommeled by the Colleges and Boards before being permitted to practice, they would accord every qualified physician the veneration due a saint.

A qualified doctor's training is more rigorous and harsh than that of the traditional Indian brave of song and story.

The only selfless and self-sacrificing profession known to humankind is the

practice of medicine. And it is the most thankless profession. Everyone is always willing to throw the doctor to the dogs.

The average qualified physician spends exactly one half of his practicing lifetime in free service and hospital clinics.

Let the legal profession step forward and show us when and where they have gone to endless trouble and effort to win sums of money for a client without remuneration! Is winning money comparable to saving a life?

When an attorney wins a sum of money for a client, his share of it is 33 to 50 per cent. How much, then, would the same attorney ask if he had saved the client's life instead?

What attorney goes to court to sue the public in behalf of the doctor's family when the doctor drops dead of a coronary attack in the early forties? That certainly would be as intelligent a procedure as suing the doctor for having a coronary attack while serving the public.

Many a fine attorney, ripened with age, becomes a venerated judge. Where are the old doctors? There aren't any. Gone is the aged "horse and buggy doctor," the clip-clop rhythm of old Dobbin's hooves, reins lax in his veined, fine hands. "There has come a day when we know not Joseph."

"Generation of vipers," we hurry, worry, defame, blame the doctor and finally sue him when all his patience, sleeplessness, kindness and skill has failed to perform the miracle we demanded. A doctor must be God or else he will be drawn and quartered.

Because the attorneys have discovered a new way of winning money, the doctor and his destiny are forgotten. The doctor is insured. How convenient to fleece an insurance company and forget what a lawsuit costs the doctor in health, dignity and time. To heck with the doctor — until you need him. The doctor and the public's need of him has been forgotten.

If there is any civilization left among us at all, let a Higher Court decide what constitutes malpractice before an attorney is permitted to defame a doctor in court and so destroy the public's faith in medicine.

Whom will you call in when you are sick and in fear of your life if you lose faith in the qualified doctor?

Permit this barbarism against the doctor and we shall soon return to the stage of our civilization when a pitifully ignorant farmer often sat with a shotgun across his knees while a doctor stood operating on his wife on a kitchen table: "If she dies, Doc, you get it too."

What Constitutes Malpractice?—When a plumber undertakes to repair the delicate mechanism of a Swiss watch — that is malpractice.

When a qualified physician performs the work for which he is eminently trained and the result is unfortunate or catastrophic, there is as much sense in suing him as there is in suing a bolt of lightning for striking your house.

The lawyer's constant cry is that the doctor is "uncooperative" when called as witness in a malpractice suit.

What the lawyer means is that he wants the doctor in court only to help him crucify a physician, not to express his honest opinion.

Eye for Eye—the Only Remedy.—Malpractice suits will cease when the doctor learns to match the attorney in benchside manners. This will have the same effect as surprising the bully on the block with a good shellacking. Only then will these shameful, injurious practices of defaming the members of the most needed and most honorable profession cease. Let the legal profession beware. The doctor is throwing his hat into the ring.

New Books

BOOKS RECEIVED

The following books have been received by the Editor; they will be reviewed critically as space and facilities permit. Omission of more extended review, however, is not to be taken as criticism of the merit of the book.

Operative Surgery. Edited by Charles Rob and Rodney Smith. London: Butterworth & Co., Ltd.; Philadelphia, F. A. Davis Co., 1956. Vols. 1 and 2 of 8 (plus index). Profusely illustrated.

Proceedings of the Third National Cancer Conference, Detroit, Michigan, June 4-6, 1956. Sponsored by the American Cancer Society, Inc., and National Cancer Institute, U. S. Public Health Service. Philadelphia: The J. B. Lippincott Company, 1957. Pp. 961.

Le Diagnostic du Cancer d'Estomac a la Periode Utile (Diagnosis of Carcinoma of the Stomach at the Time Most Favorable for Treatment). By Rene A. Gutmann. Paris: G. Doin et Cie, 1956. Pp. 257.

Pathology and Surgery of the Veins of the Lower Limbs. By Harold Dodd and Frank Cockett. Baltimore: The Williams & Wilkins Company, 1957. Pp. 462, illustrated.

Spinal Cord Compression. By I. M. Tarlov. Springfield, Ill.: Charles C Thomas, Publisher, 1957. Pp. 147, with 41 illustrations.

Lithiase de la Voie Biliaire Principale (Lithiasis of the Common Bile Duct). By Pablo-L. Mirizzi. Paris; Masson et Cie, 1957. Pp. 162, with 79 illustrations. *Reviewed in this issue.*

Surgery of the Anus, Anal Canal and Rectum. By E. S. R. Hughes. Edinburgh and London: E. & S. Livingstone Ltd., 1957. Pp. 300, with 276 illustrations. *Reviewed in this issue.*

Pre-Employment Disability Evaluation. By William A. Kellogg. Springfield, Ill.: Charles C Thomas, Publisher, 1957. *Reviewed in this issue.*

The Gynecologic Management of Urologic Injuries. By Henry G. Falk. Philadelphia: F. A. David Company, Publishers, 1957. Pp. 265, with 97 illustrations. *Reviewed in this issue.*

Perinatal Loss in Modern Obstetrics. By Robert E. L. Nesbitt Jr. Philadelphia: F. A. Davis Company, Publishers, 1957. Pp. 432, with 108 illustrations.

The Reticular Formation of the Brain Stem. By Alf Brodal. Springfield, Ill.: Charles C Thomas, Publisher, 1957. Pp. 87, with 18 illustrations.

Anatomies of Pain. By K. D. Keele. Springfield, Ill.: Charles C Thomas, Publisher, 1957. Pp. 206, with 27 illustrations. *Reviewed in this issue.*

Tumor Surgery of the Head and Neck. By Robert S. Pollack. Philadelphia: Lea and Febiger, 1957. Pp. 101, with 49 illustrations. *Reviewed in this issue.*

Tumors of the Soft Somatic Tissues. By George T. Pack and Irving M. Ariel. New York: Paul B. Hoeber, Inc., 1958. Pp. 820, with 652 illustrations. *Reviewed in this issue.*

The Activity of Prothrombin and Proconvertin in Plasma in Diseases of the Biliary Tract: A Clinical Study. By Bo Sjostrom. Stockholm: Uppsala, Appelbergs Boktryckeri AB, 1957. 27 illustrations. *Reviewed in this issue.*

Chronic Ulcerative Colitis. By Harry E. Bacon. Philadelphia: The J. B. Lippincott Company, 1958. Pp. 395. Illustrated. *Reviewed in this issue.*

Tumor Surgery of the Head and Neck. By Robert S. Pollack, Philadelphia; Lea and Febiger, 1957. Pp. 101 with 49 illustrations.

It was the author's hope to bridge the gap between general surgery, otorhinolaryngology, oral surgery and plastic surgery. The result is all too brief, both for beginners and for those with experience. Obviously, it is impossible to cover this field adequately in 101 pages. There are nine chapters, each with a reference list, although some "chapters" are only two or three pages long. Dr. Pollack set brevity and conciseness as his major goal and did not intend the work to be encyclopedic. For completeness he refers the reader to more extensive tests.

In discussing surgical intervention versus irradiation, the author concludes that "no decision for either method should be made without thorough and individual consideration of each patient." He gives no real help to the reader, however, toward rendering this decision.

There are other statements that may not meet with acceptance, such as these: "To excise locally a recurrent tumor within an irradiated field also is hazardous because healing will not occur, infection supervenes, and a painful radiation—surgical ulcer is the result."

"Little improvement, for example, can be made on the descriptive articles already available on radical neck dissections." (Or one might conclude by any of the others appearing in this book.)

"Small cancers in the vallecula may remain hidden for years in the numerous lymphoid folds of this area." (This is to be doubted. Certainly not years!)

"Cancers deep in the pyriform sinus act similarly, and again, gives as their initial sign a metastatic lymph node in the neck." (Not always! Rather, say "may give.")

"The neck holds the key to diagnosis of tumors in this region." (It may hold the key to treatment or cure, but not to diagnosis—better look into the mouth, nose, larynx, pharynx, tongue, palate and nasopharynx. Too often the surgeon does not. For him "the neck is the key!")

"Although, in general, regarding the cancer patient there is no medical contraindication to surgery, operations on the medically indigent accomplish little in the way of positive results." (To many workers in the field this is not true. There are many "mediocre risks" who respond well.)

FRANCIS L. LEDERER, M.D.

Artificial Limbs. By Leon Gillis. London: Pitman Medical Publishing Co. Ltd., 1957. Pp. 449, illustrated.

Interest in obtaining better amputation stumps and better prostheses for the amputee was stimulated by the experience of many surgeons during World War I. This interest was accentuated during and after World War II. No one in the British Isles has been more consistently interested in the subject of artificial limbs than the author of this book, Mr. Leon Gillis. Mr. Gillis has several important hospital appointments. He has been Hunterian Professor and Arris and Gale Lecturer, Royal College of Surgeons, England, and is a Fellow of the International College of Surgeons and the College of Physicians and Surgeons of South Africa. Both he and Sir Harry Platt, who introduces this book with an appropriate foreword, are world-renowned.

Gillis is the author of an excellent textbook on amputations. The volume entitled "Artificial Limbs" deals with the problems of limb fitting, the construction and use of artificial limbs and the rehabilitation of the amputee.

As Mr. Gillis states in his preface, "This book sets out to describe what is being done to replace limbs lost by war, accident, or disease, or absence by reason of congenital defect." The author has completed this reference book on the subject of prostheses after fifteen years of intensive study and research.

There are 449 pages of text, including the index, with an abundance of illustrations, including photographs, artists' drawings and

appropriate roentgenograms. The reproduction of the illustrations and the excellent detail of the type used make it easy to read and study this book.

"Artificial Limbs" should be in the library of every surgeon who expects at some time to perform an amputation or to prescribe an artificial limb for a patient.

EDWARD L. COMPERE, M.D.

Cerebral Lipidoses. By L. Van Bogaert, J. M. Cummings and A. Lowenthal. Springfield, Ill.: Charles C Thomas, Publisher, 1957. Pp. 212, with 53 illustrations.

This book consists of twenty separate papers with discussions. These papers were presented at a symposium held in Antwerp in July 1955. The symposium was organized by the Inter-University Foundation of Neuropathological Research. There were thirty-five participants. The subject was histologic and biochemical consideration of cerebral lipidoses and the leukodystrophies. The chairman was Dr. Van Bogaert.

These papers present important chemical studies on a number of degenerative diseases of the brain. As the chairman points out in his introduction, the discussions center around technic and qualitative chemical methods.

One object of the collopuim was to attempt a classification of the lipidoses, not only as separate diseases but in relation to various forms of leukodystrophy. Another purpose was evaluation of histochemical and routine histologic methods. The third object was comparison of the qualitative chemical methods used by the various investigators in their different laboratories.

This book will be of interest to all who are interested in neuropathology and in the chemistry of the nervous tissue. It will also be a valuable reference to workers in this field. Clinical neurologists and neurosurgeons will find it difficult reading unless they have some background in neuropathology and physiologic chemistry.

HAROLD C. VORIS, M.D.

Pre-Employment Disability Evaluation. By William A. Kellogg. Springfield, Ill.; Charles C Thomas, Publisher, 1957.

This manual briefly describes various disease conditions and disabilities encountered during the examination of applicants for employment. It indicates whether an applicant with a given condition should be approved with restrictions, fully approved or completely rejected, and specifies which of the thirty-five restrictions stated in the manual should be imposed for each type of physical limitation. Also included in the text are several types of personal history and medical forms for examination, graphs which deal with visual functions, height and weight guides and suitable forms for various laboratory reports.

The material in this book and the information as well as the conclusions reflect the sharp observations of a doctor who has had many years of professional experience upon which to base his conclusions and whose observations are well worth careful study and consideration.

The special features of this book are valuable in that, owing to many differences in state compensation laws, individual organizational conditions and the ease or difficulty of securing employees, it is a recognized fact that there may arise situations which require modifications in the policies stated in this manual.

The importance of a preemployment medical examination is particularly stressed, since it is of the greatest value to all employing organizations and to every potential employee. A great and significant number of applicants have some type of disability, and yet persons with physical limitations can be efficient and safe employees if restricted and assigned to jobs within their physical capabilities. In the opinion of the reviewer, this book is an excellent guide for organizations employing workers.

H. FOURNIER, M.D.

Anatomies of Pain. By K. D. Keele. Springfield, Ill.: Charles C Thomas, Publisher, 1957. Pp. 206, with 27 illustrations.

Those who assume that our knowledge of pain pathways begins with Spiller and Frozier will find Dr. Keele's book a revelation. They will learn that Spiller placed the capstone on an edifice that had taken a century of painstaking work by a number of investigators to erect. The author's story of the anatomy of pain begins with the earliest medical knowledge and continues down to

our own day. He not only traces our ideas of sensation in general and pain in particular through their development in Western Medicine but briefly describes the anatomy of pain existing in India and China. At the same time, he reminds the reader that about one-half of the population of the world today is treated on the basis of these physiologic aspects of pain that seem so remote and unimportant to a Western observer.

This is a scholarly book that will be of interest to the medical historian, the philosopher, the physiologist, the psychologist and the psychiatrist. It should be a "must" to the neurologist and the neurosurgeon. The final chapter on the structure of pain is as satisfactory an analysis of our present knowledge and theory of pain as this reviewer has encountered.

HAROLD C. VORIS, M.D.

Chronic Ulcerative Colitis. By Harry E. Bacon. Philadelphia: The J. B. Lippincott Company. 1958. Pp. 395. Illustrated.

This is an outstanding monograph by an experienced surgeon and author. It is the best book available on the subject. The style is lucid, concise and effective as well as enjoyably readable.

The various bacteria and parasites that have been investigated as the cause of this confusing disease; fungi, viruses, enzymes and allergy; collagen disease, and psychogenic and neurogenic factors are well considered in the section on etiology.

The presentations of pathologic aspects of the topic are among the highlights of this work. The same may be said of those dealing with regional ileitis, the complications of ulcerative colitis and differential diagnosis. The case for medical management is well and fairly stated, but it is in his handling of surgical procedures that the author has earned his greatest encomiums.

The surgeon whose cases of colonic disease are not numerous, however, should reflect that Bacon has cared for 400 patients with such disease in sixteen years and that a duplication of his results is not to be expected of the inexperienced.

The section on anesthesia, by Kupperman, is a highly helpful contribution.

Much detail has been carefully recorded: in therapy, when a drug is indicated, the dosage and often the timing are given; in the minutiae of pathology, exactness is the rule.

The format is worthy of note—the detailed index at the chapter heads which Bacon has used in other works, a fine book-style type, and easily held book of nearly 400 pages which at first appears smaller, splendid halftone reproductions and especially good photomicrographs—all attest to good writing and good illustration, well presented by a painstaking and capable publisher.

CLEMENT L. MARTIN, M.D.

The Activity of Prothrombin and Proconvertin in Plasma in Diseases of the Biliary Tract: A Clinical Study. By Bo Sjostrom. Stockholm: Uppsala, Appelbergs Boktryckeri AB, 1957.

This is a brief compendium on disturbances of prothrombin and proconvertin in the presence of inflammatory and noninflammatory biliary disease with and without jaundice.

There is no question that the author has done a large amount of work. In this reviewer's opinion the conclusions arrived at are debatable. Such a statement as "bilirubin and serum alkaline phosphatase are intimately bound up with the functioning of the liver, whereas the flocculation tests are less so" seems to contradict present knowledge. Again, it seems to the reviewer rather difficult to determine whether there is such an entity as noninflammatory biliary disease with jaundice. He is convinced that a true obstruction is due to inflammatory edema of the mucosa of the bile ducts around an impacted stone.

In brief, the discussion and conclusions could have been improved if the author had had the more modern American literature available.

WERNER F. EISENSTAEDT, M.D.

Chirurgie à Coeur Ouvert (Open Intracardiac Surgery). By C. Dubost et P. Blondeau. Paris: Masson et Cie, 1957. Pp. 320 with 115 illustrations.

This is a comprehensive review of open intracardiac surgical correction of congenital and acquired lesions of the heart. The authors originally planned to complete their re-

view as of the beginning of 1956, but as they were preparing the manuscript so many innovations appeared so rapidly, viz., the oxygenator (DeWall), the apparatus for induced cardiac arrest (Gibbon), etc., that they decided to include data up to 1957.

This book does not deal with surgical procedures, nor does it give precise information as to indications for operation. The authors describe present-day methods available to the surgeon, stressing the physiologic and biologic problems presented by the individual patient. Some of these problems remain to be solved.

Consecutive developments in intracardiac surgery, made possible and facilitated by hypothermy, extracorporeal circulation, oxygenation, etc., are discussed. A critique is presented of the various technics currently employed, with emphasis on those which yield the best results.

The first chapter is devoted to hypothermy, which is suitable only in certain instances. The authors state that hypothermy has reached a standstill, but they envision improvement in the technic with continued careful clinical surveillance. Further study of the biologic processes in the hypothermic body will enable the surgeon to determine limitations and dangers. The impasse in hypothermy is due to the danger that lowered temperatures may produce acute cardiac decompensation associated with ventricular fibrillation. Refrigeration below 25 or 26 C. is undesirable, because of the high percentage of fatalities resulting from ventricular fibrillation; yet this same degree of cold brings about a sufficient delay in circulation to permit efficacious operation. The range of temperature now employed (26 to 28 C.) is sufficiently safe; it permits clamping of the great vessels, however, for only about ten minutes, limiting the operation to simple intervention for pulmonary stenosis, simple interauricular communication, etc. Hypothermy might easily fall into disuse if a safe, sure method of extracorporeal circulation were devised that permitted simplification of technic.

The second chapter is devoted to the important process of extracorporeal circulation. It contains a complete historical review. Partial extracorporeal circulation is discussed in detail. Its disadvantages are the difficulty in effecting vascular shunt of the left side of the heart (auricle and ventricle), and disequilibrium between the part of the heart excluded from its blood supply and that which continues to function. Partial extracorporeal circulation provides extracardiac oxygenation, which is a problem in total extracorporeal circulation. The present goal is to perfect extracorporeal circulation that will permit sufficient time to carry out any intracardiac operation in safety. Artificial heart-lung apparatuses have been devised that permit the collection of blood from the vena cava and return it to the aorta after it has been pumped and oxygenated in an extracorporeal circuit. At present extracorporeal circulation is undergoing extensive research, and the authors cite the work being carried on in Minneapolis and at the Mayo Clinic. Extracorporeal circulation diverts the blood from the heart, but open intracardiac surgical intervention is still hampered by persistence of the heartbeat and avascularization of the heart. Induced cardiac arrest eliminates this inconvenience. The authors point out the cardiac lesions for which arrest is indicated and the relatively simple lesions with which it is not necessary. They point out that the solution of the problem of extracorporeal circulation, the perfection of heart-lung apparatuses, etc., will improve intracardiac surgical therapy in the future.

This timely volume is of interest to the cardiologist and surgeon. The clear illustrations, reproductions of the various artificial heart-lung apparatuses and analyses of results obtained with different procedures are most informative. It should have particular value to those wishing to familiarize themselves with the evolution and evaluation of open intracardiac operations, i.e., their indications, limitations, and dangers.

CHARLES PIERRE MATHÉ, M.D.

Tumors of the Soft Somatic Tissues. By George T. Pack and Irving M. Ariel. New York: Paul B. Hoeber, Inc., 1958. Pp. 820, with 652 illustrations.

With this book the authors have undertaken the tremendous task of combining pathology, pathogenesis, and treatment of tumors of the soft tissues in one volume. Only experts

like these authors could have been successful.

Drs. Pack and Ariel have indeed done a remarkable job in this publication. The book is divided into several sections. Section I deals with the natural history of tumors and discusses classification, incidents and etiology. Discussion of the role of trauma is excellent. Section II deals with treatment of tumors in general. Section III discusses specific tumors and their treatment, while Section IV deals with tumors in infants and children. Section V is an interesting addition to the book, discussing the treatment of tumors in specific regions and under special anatomic considerations. The final section deals with the prognosis of tumors and includes tabulations of the end results from the material of the authors. In this reviewer's opinion, percentage calculations for small groups of cases should have been omitted from these tabulations.

All in all, this book is clearly written, and the text is supported by excellent illustrations. The tremendous experience of the authors has helped to make it one of the most interesting books that have appeared in the past few years.

WERNER F. EISENSTAEDT, M.D.

The Healing of Wounds, edited by Martin B. Williamson, New York: Blakiston Division, McGraw-Hill Book Company, Inc., 1957.

This book, dealing with the important subject of wound healing, brings the reader's knowledge of the subject up to the latest developments. It is written by eleven well known authorities in their field, each dealing with his own subject.

The chapter "The Metabolism of Proteins and Amino Acids" is handled by Williamson. "The Role of the Ground Substance in Wound Healing" is discussed by Catchpole; "Vitamin C and Wound Healing" is handled by Fromm and Nordlie. "Hormonal Influences on Granulation Tissue Formation" are discussed by Taubenhaus, etc.

The book is extremely well edited, and one has the impression that, although different authors composed the book, there is a continuous thought connecting all chapters.

In the opinion of the reviewer, Chapter 9, "Incisions Used in Gynecology," although of practical value, is somewhat out of line with the other chapters dealing with theoretical and experimental aspects of the problem.

The book is highly recommended to anybody who not only wishes to see the wound heal but would like to know how the healing process occurs.

WERNER F. EISENSTAEDT, M.D.

Surgery of the Anus, Anal Canal and Rectum. By E. S. R. Hughes. Edinburgh and London: E. & S. Livingstone, Ltd., 1957. Pp. 300. Illustrated.

This refreshing book of 300 pages is a result of the author's training at St. Mark's Hospital, London, and his own experience in Australia. Proctologists know the soundness of this hospital's teaching. The author's concept of his subject and his procedures merit acknowledgment. Much misinformation has been published in other monographs on his subject: it is absent here. The American proctologist who is familiar with the current literature in his field will read this work with profit and enjoyment. Application of free skin grafts in the perianal region will be new to many American surgeons.

The line drawings are diagrammatic and suffer from this limitation, but most of them are helpful and define the anatomic structures concerned; the photographs, which outnumber the drawings, are excellent. The medical student, general practitioner, surgeon or proctologist will be helped by this sincere, direct exposition of rectal and anal disease.

CLEMENT L. MARTIN, M.D.

Lithiase de la Voie Biliaire Principale (Lithiasis of the Common Bile Duct). By Pablo-L. Mirizzi. Paris: Masson et Cie, 1957. Pp. 162, with 79 illustrations.

This comprehensive monograph on lithiasis of the common duct emphasizes the importance of operative cholangiographic procedures. It is based on the personal experience of the author and his collaborators, during the past twenty-five years, in the Surgical Clinic of the Faculty of Medicine, University of Cordoba, Argentina.

Prof. Mirizzi has routinely carried out operative cholangiographic investigation and fully realizes its superior value. He also

employs other current diagnostic procedures, but points out that operative cholangiographic study not only gives more precise information as to the anatomic nature and physiologic function of the gallbladder but, in grave cases, permits one to determine the operation of choice.

The author states that surgical approach to biliary lithiasis is undergoing transition and will be better understood when the surgeon realizes that the patient suffering from stone is actually suffering from disease of the common duct. He also stresses the fact that it is essential to have a thorough knowledge of the various anatomic conditions following operations on the common duct (so often neglected in the past).

In addition to supplying information on the physiologic aspects of the gallbladder, operative cholangiographic study reveals the exact location of calculi, as well as that of any obstructing lesion of the common duct. This should resolve the difference of opinion among surgeons as to the best method of carrying out lithotomy and drainage.

Cholangiography is quite technical, especially when one attempts to diagnose calculi of the common duct and those impacted in the ampulla of Vater. Removal of calculi impacted in the lower third of the common duct necessitates delicate technic.

Minimal transduodenal papillotomy is described in detail. This simple method protects the pancreas from trauma and permits one to remove the calculi via the shortest route.

Drainage is of the utmost importance after removal of stones. The technic of transpapillary drainage of the common duct is graphically described and its advantages extolled.

The book consists of four chapters. The last and longest chapter deals with surgical technic: diagnostic procedures, particularly cholangiographic, exploratory laparotomy, etc. It includes choledochotomy, transduodenal papillotomy, drainage and external and transduodenal choledocoduodenostomy.

As operations on the common bile duct are particularly interesting to the surgeon, perusal of Prof. Mirizzi's book will certainly prove worth while. It is well illustrated and contains many clear roentgenograms, accompanied by schematic drawings with detailed explanations. Clean-cut illustrations, made at the time of operation by Mlle. H. Frantz, demonstrate operative technic: cholangiography, lithotomy, drainage and the types of biliary anastomosis most frequently employed, including the author's technic. The data contained in this volume are based on 3,200 operations on the biliary tract (520 calculi) performed by Prof. Mirizzi and his collaborators. The clarity of the text and complete bibliography is invaluable.

CHARLES PIERRE MATHÉ, M.D.

Ciba Foundation on Colloquia on Endocrinology. Hormones in Blood. Edited for the Ciba Foundation by G. E. W. Wostenholme, and Elaine C. P. Millar. Boston: Little, Brown and Company, 1957. Vol. 2. Pp. 416, with 74 illustrations.

This is another of the reports published by the Ciba Foundation presenting the lectures and discussions of colloquiums on endocrinology. The papers deal with hormones in blood. The authors of the different papers are outstanding experts in their respective fields.

The book actually is a presentation of current knowledge of transportation of hormones in the blood and methods of determining hormone levels in the blood. It is beyond the scope of this reviewer to discuss the details. The book is an outstanding publication that belongs in the library of every internist and pathologist who is interested in endocrinology.

WERNER F. EISENSTAEDT, M.D.

Clinical Neurosurgery. Vol. III, Proceedings of the Congress of Neurological Surgeons, Los Angeles, California, 1955. Baltimore: The Williams & Wilkins Company, 1957. Pp. 261, with 131 illustrations.

This is the third volume of the Proceedings of the Congress of Neurological Surgeons and contains the papers presented at their 1955 meeting. Dr. Carl Rand was the honored

guest at this meeting, and his presentations on pituitary tumors, histologic changes in the human brain consequent to head injuries and two cerebral complications of pregnancy (tumors of the brain and spontaneous subarachnoid hemorrhage) comprise three of the six chapters. The other three chapters consist of three symposiums, one on thrombosis of the carotid artery, another on consciousness and coma and a third on hypothermia and hibernation in neurosurgical practice. The total number of participants in these three symposiums is ten. Dr. Rand's chapter on pituitary tumor includes an account of 100 personal cases, and the chapter on the histopathologic aspects of brain injury brings together the observations that he and Couville have reported in a previous series of papers. The discussion of brain tumors and spontaneous subarachnoid hemorrhage as complications of pregnancy should interest all obstetricians as well as neurologists and neurosurgeons.

The co-editors and the editorial board are to be congratulated on the excellence of the book. It is much more readable than the usual printed transactions or proceedings of a meeting.

HAROLD C. VORIS, M.D.

The Gynecologic Management of Urologic Injuries. By Henry C. Falk. Philadelphia: F. A. Davis Company, Publishers, 1957. Pp. 265, with 97 illustrations.

Urologic injuries amenable to gynecologic management include vesicovaginal fistula, stress incontinence and ureteral trauma, all of which are competently dealt with by Dr. Falk in this publication, one of a series on gynecology and obstetrics. Incontinence of urine in women, as is pointed out by Edwin M. Robertson, Professor of Obstetrics and Gynecology at Queens College, Kingston, Ontario, who writes the foreword, is a truly tragic condition that merits all possible attention from those capable of the difficult and demanding surgical treatment required.

The opening discussion, after a historical review of vesicovaginal fistula, enumerates the etiologic factors, the diagnosis, and the general rules of management, after which the actual repair is thoroughly discussed. The choice of operating time, the general principles of repair of these fistulas and the various technics employed are pointed out: the Sims-Emmett technic, vaginal closure in layers, the Schuchardt incision and closure of the fistula by use of extravesical tissues. The management of vesicovaginal fistula after total abdominal hysterectomy is described, as are the suprapubic, extraperitoneal, transvesical and transabdominal approaches and the repair of vesicovaginal fistulas caused by carcinoma or by radium therapy. The handling of such fistulas (and of vesicocervical fistulas) after cesarean section is also described.

The author then takes up the problem of stress incontinence, presenting his surgical approach and his technic. He has devoted years of study and effort to the correction of this distressing condition, and his comments thereon are well worth reading.

Injuries to the ureters during gynecologic operations are next covered, against a sound anatomic background and with some highly pertinent material on prophylaxis. The management of such injuries is discussed exhaustively in the final chapter.

Dr. Falk's book is printed on paper of high quality, which adds distinction to the already outstanding surgical drawings that illustrate it. These are all expertly drawn and beautifully reproduced.

The bibliographic material is appended to each chapter. There is a good cross-index that should contribute a great deal to the usefulness of the text. The book is unusually easy to read, owing to the quality of the paper and the printing, and will make a valuable addition to any surgeon's library.

M. T.

Abdominal Operations by the Vaginal Route. By Paul Werner and Julius Sederl. Philadelphia: The J. B. Lippincott Company, 1957. Pp. 165, with 120 illustrations.

Drs. Werner and Sederl here present, in an excellent English translation by Dr. L. M. Szamek, a brief but impressive account of the various abdominal surgical procedures that may be performed successfully via the vagina. Although they are so performed less fre-

quently than by means of the abdominal laparotomy, they offer distinct advantages in competent hands: lower rates of morbidity and mortality, a shortened convalescence with greater comfort for the patient, a lessening of the danger of peritonitis, a lower incidence of thrombosis and embolism, less danger of postoperative shock or pulmonary complications and, cosmetically, the complete absence of a visible scar.

Dr. Richard W. Te Linde, who contributes the foreword and whose distinction in the field is too well known to require comment, says that much can be learned even by the experienced gynecologist from a study of this volume. Its value, he adds, "lies in making available in a single small book certain technics which should be known to every practicing gynecologist. At some time in his surgical career, most of them can be utilized to the advantage of his patients. The indications may appear unexpectedly in the course of an operation, and to be fortified with the knowledge and the technical ability may save the surgeon and the patient an unnecessary laparotomy."

The operations include (1) vaginal hysterectomy, with and without removal of the adnexae; (2) total extirpation *per vaginam* of the fibroid uterus; (3) vaginal resection of the uterine body and subtotal hysterectomy; (4) vaginal enucleation of a fibroid; (5) operation by the vaginal route for ectopic pregnancy; (6) extirpation of ovarian cysts by the vaginal approach; (7) vaginal tubal sterilization; (8) vaginal antefixation of the uterus by shortening and fixation of the round ligaments; (9) vesicovaginal interposition of the uterus, and (10) incision and drainage of an abscess from the posterior fornix. Each is abundantly illustrated by page-sized surgical drawings of impeccable quality and clarity.

What the authors have here accomplished, within the limits of a volume of moderate size, is truly remarkable. Up to this time there has been a notable scarcity of exact, and at the same time readable, descriptions of the details of these operations, which may partly account for the delay in their wider adoption among gynecologists. According to the authors, surgical proficiency in these apparently complicated procedures is not as hard to acquire as it seems at first glance. However that may be, it is well to have both sides of the story as a basis for judgment, and in this book surgeons will find the more or less neglected side ably defended.

M. T.

Bone Tumors: General Aspects and an Analysis of 2,276 Cases. By David C. Dahlin. Springfield, Ill.: Charles C Thomas, Publisher; 1958. Pp. 219.

This is a reference book for students, pathologists, surgeons and roentgenologists who are interested in obtaining a better understanding of the primary neoplasms of bone. The book contains 219 pages of text, with illustrations of the roentgenologic and pathologic manifestations of each of the malignant and several benign primary bone lesions. The clinical signs and gross pathologic and histopathologic features of 2,276 consecutive primary tumors of bone diagnosed at the Mayo Clinic are analyzed in this book.

Chapter One discusses a classification of bone tumors based upon histopathology. General statistical data regarding the relative incidence of the various types of tumors are included in this chapter. The last chapter presents a discussion of bone lesions most likely to be confused with primary neoplasms of bone from the standpoint of clinical history and examination and the roentgenographic appearance of the lesions.

David C. Dahlin, the author, is consultant in the Section of Surgical Pathology at the Mayo Clinic and Associate Professor of Pathology of the Mayo Foundation, Rochester, Minnesota. He is widely known because of many publications based upon his studies of the pathology of bones, and his opinion is highly respected. Too often general pathologists have been inclined to depend for a definite diagnosis upon a small amount of tissue obtained by a surgeon through biopsy of a lesion. Such pathologists sometimes ignore the history, the roentgen data, or the general course of the disease. None of these errors has been made by Dr. Dahlin, who throughout the text has emphasized the

importance of the roentgenographic appearance and the physical and laboratory signs in making a definitive diagnosis.

Treatment and prognosis for each tumor type are discussed in a way that should be helpful to the young doctor who seeks to obtain a better understanding of the neoplastic lesions from which his patient may be suffering.

EDWARD L. COMPERE, M.D.

An Introduction to Chest Surgery. By Geoffrey Flavell. London: Oxford University Press, 1957. Pp. 354, with 180 illustrations.

This book, intended primarily for students, is a clear, concise and interesting text that is exactly what it was meant to be—an introduction to thoracic surgery.

Recalling his own student days, the author finds that there are two things wrong with most medical books—first, they are difficult to read; second, they cost too much.

Both objections have been eliminated here. The first is taken care of by the fact that the author's style is easy, graphic and conversational and that his text is illuminated by 128 roentgenograms, excellently reproduced, and 52 surgical drawings; the second, by the fact that the price of the book brings it easily in reach of most students and all surgeons. The author's conviction that the function of a book is to communicate and, in the case of an introductory work to be used by the beginner, to communicate agreeably is one that could be shared to great advantage by all authors of scientific texts.

The book is divided into three parts. The first deals with surgery of the lungs, pleura and thoracic contents. In this part, the author reviews the anatomy of the chest and describes in detail various pathologic conditions of the lungs.

The second part deals with surgery of the esophagus, and the third with surgery of the heart and great vessels. All are well and logically organized. Pathologic conditions involving the thorax and its contents are handled in what would seem to be the natural order—first a thorough description of the disease or the lesion and then a careful presentation of its surgical treatment. Diagnosis and the selection of patients for operation are fully covered.

The importance and value of such a work today is well emphasized by the publishers' comment: "So many of the greatest surgical advances in recent years have been in the field of chest surgery that it may be considered the treatment of choice, at times the only curative treatment, for many common conditions that are, by tradition, still classified as 'medical.'"

Mr. Flavell's book can be confidently and enthusiastically recommended to all students and all surgeons beginning practice, but its value is not confined to these. It offers an excellent "refresher course" to anyone concerned with thoracic surgery.

M. T.

The Early Diagnosis of the Acute Abdomen. By Zachary Cope. London: Oxford University Press, 1958. Pp. 188, with 36 illustrations.

The eleventh edition of this classic dealing with surgical diagnosis can take its place proudly among those editions which have preceded it. Sir Zachary has an uncanny ability to present difficult material in a clear, concise and lucid manner. The entire text has been thoroughly revised and recent data added. The sections discussing the diagnosis of vascular surgical conditions and intestinal obstruction emphasize current concepts. The author has deemed it wise, and correctly so, to beam much of this information to the general practitioner, who, after all, is our first line of diagnostic defense and who welcomes such pithy presentations.

The illustrations are simple and to the point. There should be no doubt in the viewer's mind as to the diagnostic point portrayed. The tremendous number of earned testimonials that this distinguished author has received in the past will no doubt be greatly increased by the appearance of this edition. This work can be recommended unreservedly and enthusiastically to anyone interested in surgical diagnosis.

PHILIP THOREK, M.D.

Abstracts from Current Literature

Androgenic Therapy of Women. Hamben, E. C., Southern M. J. 50:743, 1957.

The use of androgenic hormones has been both increased and varied as knowledge of the endocrinologic field has been extended.

There is clinical need of anabolic steroids that are devoid of androgenic, osteogenic, progestational or other undesirable side activities. None is available at present.

Methyltestosterone and testosterone propionate, relatively slow-acting and rapidly eliminated androgens, are judged to be the best currently available androgens for the treatment of women. Their use should be founded upon a definite and logical indication; their empiric use is to be condemned.

The most general indication for the androgen therapy of women is based upon the desirability of the anabolic action of androgens upon protein and osseous tissues. Estrogenic therapy may provide similar action, and estrogens should be used when their anabolic effect is adequate; otherwise, combined androgen-estrogen therapy is indicated.

Androgen therapy, regardless of low dosage or combination with estrogens, exposes women to the possibility of virilization. Careful supervision of all androgen-treated women, therefore, should be maintained, and treatment should be discontinued at the earliest sign of virilization unless the benefit of the therapy justifies so sacrificial a cost.

EDMUND LISSACK, M.D.

Osteitis Pubis After Inguinal Herniorrhaphy. Le Vay, D., and Borman, J. B., Lancet 2:1252, 1957.

Osteitis pubis complicating herniorrhaphy has not previously been reported. The 3 patients whose cases are described in this article were operated upon by two surgeons employing different technics and different nonabsorbable suture material in each case.

All 3 patients exhibited remarkably similar clinical and recuperative characteristics.

As this pathologic process has been generally regarded as a complication of operations on the urinary bladder or the prostate it is important to observe that osteitis pubis has been attributed also to the trauma of track-running, normal childbirth and caesarean section.

In each of the 3 cases here described the wounds healed normally at first and remained so healed in 2. In 1, stitch sinuses appeared after a few weeks and healed promptly after extrusion of the offending material.

In the second or third postoperative week, pain appeared in the lower part of the back, the pubic and perineal regions and the upper parts of the thighs, with difficulty in walking, malaise and general distress. The gait was characteristic—that of "a cat on hot bricks." As the symptoms in the anterior part of the pelvic arch subsided, pain and tenderness developed more posteriorly in the ischial tuberosities. This was so severe that sitting up with the leg straight and sitting in a hard chair were impossible. This ischial pain lingered on for many weeks after walking had become normal.

The radiographic features were also similar. Diffuse osteoporosis of the pubic and ischial rami, with widening of the symphysial gap, were already established when the clinical features drew attention to the disease.

Diagnosis was difficult. In the first case the condition was originally labelled tuberculosis of the symphysis; in case 2, poliomyelitis, and in case 3, a probable lesion of a lumbar disc.

A combination of factors, including traumatic, vascular and infective components, appeared to the authors to be the only presently rational explanation for the development of the disease.

Although cortisone had been reported as producing dramatic and lasting improvement, the admittedly limited experience of the authors indicated to them that complete bed rest was the most valuable method of relieving pain and eliminating most of the gravity strains

and muscle pulls playing upon the diseased section of the pelvis. In their opinion, chemotherapy and cortisone exerted little if any influence on the course of the disease, although local injections of hydrocortisone appeared to be helpful for the troublesome ischiitis and ischial bursitis.

Suppuration appeared in none of the 3 cases, although this process, complicated by sequestration, has been reported by urologists.

All 3 patients had completely recovered after five months. This period included prolonged physiotherapy for the restoration of full power to the wasted muscles and full movement to the hip joints.

THOMAS WILENSKY, M.D.

Gastroesophageal Junction During Swallowing and Drinking. Creamer, B., and Pierce, J. W., Lancet 2:1309, 1957.

These authors discuss the contested presence of a sphincteric mechanism at the gastroesophageal juncture and then present their own experimental work in this field. Cineradiographic studies were performed on a group of patients, and at the same time pressure recordings were made during the passage of barium through the gastroesophageal juncture. Roentgenograms, diagrams, charts and technical explanations are given in detail. The authors conclude that there is a marked difference between the physiology of swallowing and drinking. The act of swallowing is accompanied by sphincteric action in the distal 2 to 3 cm. of the esophagus, whereas the act of drinking seems to have no such sphincteric accompaniment. Their conclusions are that drinking and swallowing are different physiologic processes and that the gastroesophageal sphincter is opened earlier in drinking than in swallowing.

JAMES H. ERWIN, M.D.

Term Birth Following the Construction of an Artificial Vagina. Word, B., Southern M. J. 50:1134, 1957.

The female genital tract as a whole has two functions, the reproductive and the sexual. The sexual function is secondary, developed by nature to insure reproduction. In correcting the defect of congenital absence of the vagina, it is rare indeed to make possible the fulfillment of both functions, for the simple reason that 92 per cent of patients with congenital absence of the vagina also have congenital absence of the uterus. It should be remembered, however, that the other 8 per cent do harbor a functioning uterus, and every effort should be made, in examining these women, to determine whether a functioning uterus is present and, if so, to preserve it for the possibility of reproduction. For normal pregnancy to occur and progress to term, a functioning uterus must be present.

In this study the author shows that, of the 25 term deliveries following the construction of an artificial vagina, 14 were vaginal and 11 by cesarean section. It is not concluded from this study that the best method of terminating a pregnancy in these circumstances is vaginal delivery. Each patient must be studied and treated individually, with consideration of the type of operation performed to correct the original defect and, obviously, of any other obstetric indications for abdominal delivery. It is a fact, however, that 10 of the 25 patients who became pregnant and progressed to term after construction of an artificial vagina were delivered spontaneously.

EDMUND LISSACK, M.D.

On the Presence of an Antineoplastic Principle in Normal Tissues. Gevese, P. G., Arq. de Patol. 29:237, 1957.

In this paper the author tries to demonstrate by means of his own experiments the presence or absence of an antineoplastic principle. He tabulates 50 cases and describes his particular technic in which a graft of healthy skin procured from a distant area was transferred to the surface of a neoplasm. In a number of cases in which the graft began to grow, the tumors changed; in others, the tumor growth was not influenced. Histologic details are reported. The relatively high number of recoveries from previous tumor growth leads the author to consider strongly the presence of some unknown substance in healthy tissue that is able to oppose tumor growth.

JAMES H. ERWIN, M.D.

Subtotal Gastrectomy and Hemigastrectomy with Vagotomy for Duodenal Ulcer. Harrower, H. W.; Cooper, P., and Smithwick, R. H., J.A.M.A. 165:1270, 1957.

Since early 1954, the preferential elective surgical treatment of patients with duodenal ulcer at the authors' hospital has been hemigastrectomy with vagotomy. In order to evaluate this operation and for added comparison with a similar series reported in 1952, 45 cases in which the patients were so treated are presently compared with a similar number of cases in which subtotal gastrectomy without vagotomy was performed.

The authors, by this comparison, have confirmed their previous impression that hemigastrectomy with vagotomy is the better of the two operations. They support this conclusion by presenting a statistical analysis of the several groups, which demonstrates that the combined procedures are more frequently followed by the desired achlorhydria than is subtotal gastrectomy alone, and that it was less frequently complicated by disabling sequelae or recurrent ulcer.

Most of the operations were performed by surgical residents, and the incidence and character of surgical complications was quite unremarkable.

Although the mortality rate of elective subtotal gastrectomy for duodenal ulcer has been about 1.5 per cent up to the time of writing, the authors have encountered no deaths among more than 100 patients subjected to hemigastrectomy and vagotomy.

Severe degrees of weight loss, dumping and moderate to severe disturbance of meal pattern were also more frequent in the group of patients submitted to subtotal gastrectomy only; persistent mild to moderate diarrhea was more frequent in patients treated by hemigastrectomy and vagotomy. Two patients in the subtotal gastrectomy group complained of recurrent ulcer symptoms at the time of examination. This impression was supported by roentgen evidence in both cases and by the presence of melena in 1. At present, ulceration of the stoma has not been encountered in any patient treated by hemigastrectomy and vagotomy.

In the opinion of the authors, and with support provided by the reports of other investigators, it appears that hemigastrectomy with vagotomy offers greater protection against recurrent ulceration than does vagotomy with gastroenterostomy and fewer disabling sequelae than does two-thirds to four-fifths gastric resection with vagotomy.

THOMAS WILENSKY, M.D.

Ten Years' Experience with Culdoscopy. Josey, W. E.; Thompson, J. D., and Te Linde, Richard W., Southern M. J. 50:713, 1957.

An analysis of 594 culdoscopic examinations performed in the gynecologic service of Johns Hopkins Hospital is presented, representing the aggregate experience of 59 operating surgeons over a ten-year period.

In the clinic at Johns Hopkins Hospital, culdoscopic study has been helpful in ruling out or establishing a diagnosis of ectopic pregnancy when the results of other methods of investigation are inconclusive. In addition, it has been useful in selected cases of suspected endometriosis, unexplained abdominal pain, pelvic masses of uncertain character, suspected tuberculosis, sterility and endocrine disorders. It appears that culdoscopic investigation, if used successfully, will substantially reduce the number of patients who require laparotomy for the aforementioned conditions.

The procedure is relatively safe but, like certain other diagnostic methods, is not without danger when injudiciously employed.

EDMUND LISSACK, M.D.

Cystoscopy in the Investigation of Postmenopausal Bleeding. Dewhurst, C. J., and Dutton, W. A. W., Lancet 2:524, 1957.

The authors cite 6 cases of vesical tumor in 176 cases of postmenopausal bleeding. The patients were under the impression that the bleeding was vaginal; all had noticed bleeding during or after micturition, and in none of the aforementioned cases were red blood cells discovered in the urine.

A history of bleeding should suggest the possibility of a vesical cause for the hematuria.

SHEPARD JEROME, M.D.

Excision and Arterial Grafting in the Surgical Management of Popliteal Aneurysms. Austin, D. J., and Thompson, J. E., Southern M. J. 51:43, 1958.

Twenty-one aneurysms in 15 patients formed the basis for this series, which began prior to the availability of arterial homografts. There were 14 men and 1 woman in the age range from 50 to 85 years. In 6 patients the aneurysms were bilateral.

This article contains a brief but valuable historical survey of the management of popliteal aneurysms.

In this small series of patients, 7 aneurysms in 6 patients were treated by nonsurgical measures, including sympathetic blocks, anticoagulants or like. These were "poor risks," 6 of whom presented complications when first seen. The prognosis of untreated popliteal aneurysm, as indicated by this small group, is poor.

In a second series of 6 aneurysms in 6 patients treated by sympathectomy with and without excision of the aneurysm and by excision alone there were no deaths and 2 amputations for gangrene. All of these patients were seen after a complication had occurred. Of the 4 surviving limbs none is entirely asymptomatic, but 3 are satisfactory and allow the patient to walk with only mild inconvenience.

Eight aneurysms in 7 patients were treated by excision, arterial homografting and lumbar sympathectomy. One elderly patient, who had earlier undergone cerebrovascular accident, died suddenly from a similar episode two weeks after the amputation. In the six surviving patients all extremities have good to excellent circulation, and 5 have palpable pulses at the ankle.

At present this third method of management is considered the ideal treatment, which can be accomplished if the diagnosis is made prior to the onset of serious complications.

Although a popliteal aneurysm is usually quite apparent, the diagnosis occasionally is difficult.

Oscillometric examinations revealing markedly increased oscillations should make one suspect a lesion in any patient with symptoms of peripheral vascular disease of the legs. Arteriographic visualization of the aneurysm is occasionally indicated.

THOMAS WILENSKY, M.D.

Survival from Cancer. Shaw, H. W., and Claugus, C. E., Kentucky M. J. 55:336, 1957.

The authors review the plan of therapy at Louisville Veterans Administration Hospital since 1946 as applied to carcinoma. Basically the therapy has consisted of radical operation for all carcinomas not amenable to roentgen therapy. Complementary roentgen therapy or other palliative measures have been employed.

Survival alone is considered, the survival rate being compared with that of a series observed prior to 1946. The authors include tumors of the following organs: tongue, larynx, lung and bronchus, esophagus, stomach, pancreas and colon. They divide tumors of the colon into those of the colon proper and those of the rectum, outlining briefly the mode of surgical attack upon tumors of each particular organ. Survival percentages for each of the organs mentioned are as follows: tongue, 42; larynx, 29; lung and bronchus, 28: esophagus, 6; stomach, 5; pancreas, 0; colon (exclusive of the rectum), 35, and rectum, 29.

In reading the article it must be kept in mind that these are survival statistics only. There is no mention of the number of survivors who had continuing or recurrent carcinoma at the time of writing.

JAMES H. ERWIN, M.D.

Correlation of the Pathologic and Radiographic Findings in Tumors and Pseudotumors of the Gallbladder. Jones, H. W., and Walker, J. H., Surg., Gynec. & Obst. 105: 599, 1957.

This valuable contribution proposes a classification of tumors and pseudotumors of the gallbladder and makes a most commendable effort to separate demonstrable intraluminal nonopaque tumors into epithelial neoplasms with malignant potential and benign inflammatory or metabolic lesions. The sole indication of such a tumor must be cautiously and carefully evaluated as an indication for cho-

lecystectomy, and such a decision should never be reached on the basis of a single examination.

In the past, the literature dealing with this question has for the most part referred to the occasionally observed small intraluminal and nonopaque tumors of the gallbladder as "papillomas." The proposed classification represents a correlation of the radiographically demonstrable lesions with their gross and microscopic pathologic character.

Proposed Classification	No. of Tumors in 1,000 Gallbladders Removed
1. Epithelial tumors	
A. Papilloma	3
B. Adenoma	4
C. Carcinoma	12
2. Mesenchymal tumors	1
3. Pseudotumors	
A. Cholesterol polyp	16
B. Inflammatory polyp	4
C. Cholecystitis glandularis, proliferans	3
D. Congenital malformations	5

Papilloma—This term is limited to focal epithelial proliferations fulfilling the usual criteria for benign true neoplasms that may undergo malignant transformation.

Adenoma.—These tumors should arise only in the infundibulum, this being the only area in the gallbladder where glands normally occur. The cases studied suggest that this tumor is comparable to adenoma of the colon in gross and microscopic structure and in its malignant potential.

Carcinoma.—A high incidence of infiltrating carcinoma of the gallbladder has been observed in association with a residual unchanged papillary or adenomatous structure.

Cholesterol Polyps.—These are histologically exaggerated foci of cholesterosis and consist of large collections of lipid-laden macrophages beneath the basement membrane of the epithelium. They are occasionally associated with diffuse cholesterosis and are rarely larger than 6mm in diameter.

The authors admit their inability to differentiate, in all instances, papillomas, adenomas, inflammatory polyps and cholesterol polyps on the basis of cholecystographic examination. They point out, however, certain differential features that have general value. The papilloma and the adenoma are characteristically solitary lesions, the papilloma tending to be flat or sessile while the adenoma is often pedunculated.

Cholesterol polyps appear as well-delineated translucencies, usually multiple and spherical because of their narrow pedicles. An important feature of the cholesterol polyp is the unusually intense ability of the gallbladder to concentrate. The papilloma, the adenomatous polyp and the inflammatory polyp are quite frequently associated with gallstones and with gallbladders showing somewhat diminished ability to concentrate.

The commonest developmental abnormality that produces a demonstrable tumefaction in the gallbladder is the so-called "adenomyoma." This lesion is characteristically in the gallbladder fundus and is covered by grossly normal mucosa. Often it exhibits central umbilication. The authors prefer to call such lesions "myoepithelial anomalies," ascribing their origin to failure of orientation of cells in the tip of the primordial gallbladder bud. Because of their fundic situation, a frequent focus of primary carcinoma of the gallbladder, they may be mistaken at gross examination for carcinoma.

The authors outline the details of their meticulous radiographic technic, which, in their opinion, has contributed to the detection of intraluminal cholecystic defects.

They add that an accurate classification of a large series may throw additional light on the natural history of carcinoma of the gallbladder. At present their experience permits them to conclude that a solitary radiographically unclassifiable tumor of the gallbladder consititutes an indication for cholecystectomy.

THOMAS WILENSKY, M.D.

Changing Concepts of the Pathology and Management of Acute Arterial Occlusion of the Lower Extremities. Lowenberg, E. L., Southern M. J. 51:35, 1958.

As the pathologic features of acute arterial occlusion of the lower extremities have become better understood, a more aggressive policy of management has evolved, its objective being preservation of the full function of the limb by

restoration of peripheral pulses. Management, surgical or medical, that fails to prevent ischemic manifestations or that results in limitation of activity due to claudication is no longer considered adequate.

Because the degree of residual arterial insufficiency following conservative treatment is unpredictable and may become apparent only when the patient becomes ambulatory, the author stresses the value of reconstructive surgical technics, that is, thromboendarterectomy and arterial grafting for most embolic or thrombotic arterial occlusions except those occurring in relatively young persons free of atheromatous disease in which instances standard embolectomy may produce entirely satisfactory results.

THOMAS WILENSKY, M.D.

Closure of Bronchial Stump After Pneumonectomy. Goffi, F. S., and Goncalves, E. L., Surgery 42:511, 1957.

This study is based upon the analysis of results of 35 left pneumonectomies performed upon healthy adult dogs. According to the technic employed for closing the bronchial stump, the animals were divided into six groups:

Group 1: Mattress suture plus through-and-through end sutures were used on 7 animals.

Group 2: Through-and-through end sutures without pleurization were used in 8 animals.

Group 3: Through-and-through end sutures followed by pleurization were used in 5 animals.

Group 4: Through-and-through end sutures plus skin graft were used in 5 animals.

Group 5: Through-and-through end sutures plus pleuropericardial free graft were used in 5 animals.

Group 6: Through-and-through end sutures with stainless steel wire were used in 5 animals.

The authors chose the seventh postoperative day to evaluate the stump tissues' tensile resistance. This was done with a mercury manometer connected with an oxygen cylinder by means of a T tube. The pressures at which leaks occurred with the various technics were noted.

In general, the authors conclude that there is no significant difference between the various good technics, but that, in general, some effort at using the pleura, either as a free graft or a pleural flap, is of definite value in the prevention of fistulization of the bronchial stump. The use of free skin grafts for the protection of the bronchial stump does not cause a significant increase of the tensile strength of the suture No significant difference was noted between cotton and stainless steel wire as material for closure of the bronchial stump.

JAMES H. ERWIN, M.D.

Hemorrhage from the Upper Gastrointestinal Tract. Webber, J. F.; Nash, E. C., and Gregg, L. A., J.A.M.A. 165:1899, 1957.

This study was derived from the observation of 300 instances of gross hemorrhage from the upper part of the gastrointestinal tract observed in 271 male patients in a Veterans Administration Hospital. The rate of admission was highest in March and April.

Peptic ulceration of the stomach, duodenum, or jejunum was responsible in 70 per cent of the cases. Duodenal ulcer was the characteristic lesion in patients under the median age of the series (41 years). The median ages for patients with esophageal varices and for those with benign gastric ulcer were ten and fourteen years, respectively, above the median for the series.

Serious complicating disease was encountered five times as frequently in the older half of the group.

Melena was the universal symptom of hemorrhage, while hematemesis occurred in approximately 60 per cent of the patients. The previous occurrence of one or more hemorrhages was recorded in nearly half the cases. During the last year covered by this report, which embraces a five-year period, direct diagnostic measures, such as roentgen examination and gastroscopic and esophagoscopic study, were undertaken much more promptly.

Gastritis was not an entirely satisfactory explanation for hemorrhage in this series, and the diagnosis was reached by means of gastroscopic observation or on clinical grounds, particularly the cases of alcoholic patients without evidence of peptic ulcer or esophageal

varices. In three cases this diagnosis was made after subtotal gastrectomy.

In 8 per cent of the entire series the cause of bleeding was undetermined, and delay of investigation is held partially responsible for this diagnostic failure.

Blood transfusion was carried out in all cases of significant blood loss. The average amount of blood administered was 3,000 cc. Persistent bleeding or its recurrence after apparent cessation classified the patient immediately as a candidate for probable emergency surgical intervention. The crude mortality rate for the entire series was 14 per cent, indicating the gravity of the process but failing to qualify it, as the mortality rate was only 3 per cent among patients with hemorrhaging duodenal ulcer. In most of the fatal cases there was complicating disease of the heart, blood vessels, lungs, liver or kidneys.

In cases of gastric ulcer the outcome was less favorable, the mortality rate being 22 per cent. The survival rate was less than 50 per cent in the group with bleeding esophageal varices. In all of the fatal cases in this group, advanced cirrhosis of the liver was present and the coma resembled that ordinarily associated with hepatic failure.

There was a direct relation between advancing age and death from gastrointestinal hemorrhage. Factors to be considered under this item of aging are the degree of arteriosclerosis, the general decline in tolerance to trauma with advancing years, the increasing frequency of complicating visceral disease and the fact that duodenal ulcer, the commonest source of bleeding in youth, becomes relatively less frequent with advancing years, being replaced in succeeding decades by lesions more inclined to massive bleeding.

In the opinion of the authors, the patient with massive bleeding from the upper part of the gastrointestinal tract is best managed by a closely cooperating team consisting of internist, surgeon and radiologist. Every effort should be made to reach an accurate diagnosis within the first twelve to twenty-four hours. Reasonable vigorous manipulation during fluoroscopic study, in the authors' experience, has produced no recognizable damage and has increased the diagnostic value of the examination.

Their surgeons have been more willing to proceed with abdominal operations when they have been assured in doubtful instances, by means of esophagoscopic and gastroscopic studies, that the site of bleeding is not in the esophagus.

The renewal of bleeding after six to eight hours in the hospital will almost certainly require surgical intervention. This decision, once made, should be acted upon promptly. An additional and more recently recognized argument in favor of surgical intervention is the possible development of a hemorrhagic diathesis due to thrombocytopenia in patients given more than 10 units of blood within forty-eight hours.

For severe bleeders, the hourly recording of the volume of urine from an indwelling catheter has proved a valuable guide as to the adequacy of blood replacement.

THOMAS WILENSKY, M.D.

Ligation of the Inferior Vena Cava for Thromboembolism. Dale, W. A., Surgery 43:24, 1958.

The therapy of thromboembolism is still obscured by large defects in knowledge of its etiologic background and natural history. The numerous prophylactic and therapeutic regimens proposed and tried attest to this, and there is considerable evidence that there has been no real decrease in the incidence of the disease for many years. Despite early enthusiasm for a succession of prophylactic measures such as early ambulation, ace bandages and leg exercises, there is no convincing evidence that any of these has truly changed the pattern. Even the effectiveness of intermittent anticoagulation as used by the Swedes has been questioned.

While prophylaxis is uncertain, therapy of established disease has resulted in lower morbidity and mortality rates. Careful and adequate anticoagulation therapy or venous ligation has resulted in fewer fatal pulmonary embolisms. Anticoagulants at present appear to have resulted in as good protection as has femoral ligation, although

neither offers 100 per cent assurance. Ligation of the inferior vena cava approaches such 100 per cent assurance of embolism control, yet results in a significant number of abnormal legs among the late results. Whether this number is greater than could be expected from phlebitis not treated by caval ligation is unknown, and comparative figures are needed. For the present, however, it does not appear justified to subject large groups of patients to caval ligation in order to protect the occasional one who will not be controlled by drugs alone. Rather, it appears proper to reserve caval ligation for failure of or resistance to anticoagulant drugs, plus certain other less frequent indications. The patient would then undergo an operation to prevent embolism after failure of nonoperative treatment. The leg cost can thus be reduced to a reasonable one by an interested physician dealing with a cooperative patient. In the absence of patient cooperation or close supervision the results are apt to be considerably worse.

Careful postoperative management of the legs is chiefly aimed at prevention of edema. Clinical experience has indicated that the methods described here are practical and effective in preventing serious complications but that minor abnormalities continue to occur.

The author's conclusions are as follows:

1. The clinical management of 16 instances of ligation of the inferior vena cava for thromboembolism is discussed against the background of experience reported in the literature.

2. There was no operative mortality and no further embolism. While early postoperative edema of the leg was usual, the late leg complications proved to be minor if the legs were carefully managed. Three of 9 patients followed beyond ten months have some edema or ulceration of the legs, although no patient has been incapacitated.

3. Anticoagulant drug therapy is advocated for venous thrombosis and/or pulmonary embolism in general. Ligation of the inferior vena cava (rather than superficial femoral vein ligation) should be reserved for (a) failure of anticoagulant therapy, (b) contraindication to anticoagulants and (c) thrombosis of the pelvic veins (iliac, ovarian, prostatic, and so forth). Rare indications include septic pelvic phlebitis and phlegmasia cerulea dolens.

4. Operative technic and anomalies of the vena cava are discussed.

5. Details of postoperative leg management, which are chiefly directed toward prevention of edema at any time, are emphasized.

WILLIAM E. NORTH, M.D.

Severe Hemorrhage Following Gastrectomy. Wilkins, R. W.; Rogers, L. S., and Straehley, C. J. Jr., Arch. Surg. 74:345, 1957.

Bleeding as a postgastrectomy hazard has received little attention in the American surgical literature. In order to correct this omission, and stimulated by the occurrence of serious postoperative hemorrhage in 2 of the last 100 consecutive subtotal gastrectomies performed at their hospital, the authors have collected a total of 14,324 gastrectomies from the literature and have determined that the incidence of serious postoperative hemorrhage following subtotal gastrectomy is about 1 per cent and that 1 patient in 10 having such a complication may be expected to die from it.

The sources of postgastrectomy hemorrhage most frequently reported are (1) the anastomotic suture line, (2) a remaining or overlooked ulcer, (3) postgastrectomy gastritis, (4) the duodenal stump suture line, (5) new gastrojejunal ulcer, (6) hemorrhagic diseases and (7) jejunogastric intussusception.

It has not been possible to indicate the relative frequency of the sources of bleeding, as the number of cases in which the observations at reoperation or autopsy have been reported is very small.

It is the impression of the authors that improperly ligated vessels on the gastric side of the anastomosis and a duodenal ulcer left *in situ* are the most common causes of bleeding in the early postoperative period. By contrast, acute gastritis or slough of the tissue incorporated in a hemostatic suture at the anastomosis is more apt to cause bleeding during the second and third postoperative week.

The present analytic study revealed no ap-

parent relation of postgastrectomy hemorrhage to the type of gastrectomy, the use or omission of clamps, the number of rows of sutures in the closure or the presence of benign or malignant disease.

Prevention of this serious complication demands (1) individual ligation of bleeding points, (2) placement of the stoma in the antimesenteric line of the jejunum, (3) avoidance of folds in the closure, especially at the angles, and (4) a two-layer closure with use of a continuous hemostatic inner suture. It is understood that the duodenal stump closure must be meticulous to secure hemostasis. Finally, unless its excision is entirely too hazardous, a duodenal ulcer should be removed with the resected duodenum, to prevent postoperative hemorrhage from the ulcer bed.

Postgastrectomy hemorrhage should be handled conservatively at the outset. Maintenance of blood volume and continuous gentle lavage and suction to decompress the stomach will usually serve to control the situation. The patient's clotting mechanism deserves scrutiny and correction if a deficiency of vitamin K, calcium, or fibrinogen is detected. The absorbable gelatin sponge powder (Gelfoam) thrombin treatment of Cantor has been regarded as useful by some.

In the rare case, the continuation of massive bleeding makes reoperation imperative. If the duodenum is not suspiciously distended and discolored, gastrotomy through the stomach pouch or at the anastomotic line is indicated. This may be a most difficult technical procedure, and stay sutures are useful to pull the anastomosis into view.

When the duodenum is distended and discolored with blood, or when the blood is seen to flow from the afferent loop, the bleeding source is most probably a retained ulcer or the duodenal stump suture line. It then becomes necessary to open the closed duodenum for control. Hemorrhage from a retained ulcer is a considerably more difficult problem, and additional mobilization with resection of the ulcer is the most reliable method of stopping the hemorrhage. Less thoroughgoing methods may be necessary when the condition of the patient does not permit this major intervention. At such a time, suture of the ulcer base, absorbable gelatin sponge packing or ligature of the involved artery may control the hemorrhage.

Satisfactory secondary closure of the reopened duodenal stump is usually impossible, and a catheter duodenostomy is ordinarily needed. When massive hemorrhagic gastritis is the sole cause of hemorrhage observed at reoperation, the only solution is a higher resection, despite the fact that the patient is often a very poor risk for such a procedure. The first of the patients in the authors' 2 reported cases responded to the intragastric instillations of absorbable gelatin sponge powder and thrombin solution, with subsequent uncomplicated recovery; the second, in whom the duodenal ulcer had been left *in situ*, was necessarily subjected to an emergency gastrotomy when he failed to respond to massive blood replacement. Fresh blood in large quantities was seen coming from the afferent loop. Because the patient's poor condition precluded further resection of the duodenum, a double jejunostomy was done in the efferent loop, the proximal tube being placed through the stoma into the duodenum and a feeding tube being placed distally. Continuous suction on the proximal jejunostomy tube was carried out, with a rapid decrease in bleeding and uneventful recovery.

THOMAS WILENSKY, M.D.

Results of Nylon-Darn Repairs of Herniae. Moloney, G. E., Lancet 1:273, 1958.

A personal series of 253 inguinal herniae repaired with a nylon darn and surveyed more than five years after the last operation, with a 76 per cent follow-up, revealed 2 recurrences (0.8 per cent).

A series of 2,181 abdominal hernias repaired with nylon sutures by the general surgeons and their staff in the Radcliffe Infirmary and Churchill Hospital in Oxford have been reviewed from the aspects of sepsis (immediate and delayed), sinuses, hematomas and "returns" with recurrence.

Both monofilamentous and braided nylon were used, each in about 1,000 instances, with no apparent difference in the soundness of the resulting repairs.

Both varieties of nylon reacted well to immediate sepsis and needed removal for

that reason in only 1 in 1,000 repairs, for each variety.

The two varieties showed about the same number of sinuses after sepsis and hematomas (21 braided, 19 monofilamentous), but the subsequent healing differed considerably. With braided nylon the 21 sinuses required removal of the nylon in 17 instances, whereas with the monofilamentous nylon 19 sinuses required removal of sutures in only 4 instances.

The cause of many of the sinuses and of the need for removal of the nylon was a delayed reaction seen almost entirely with the braided variety (in inguinal and femoral herniae only, 10 braided to 1 (?) monofilamentous). This reaction comes on one to eighteen months after insertion of the sutures and may be more of a foreign body reaction than sespis.

"Return" recurrences for the different varieties of abdominal hernia are analyzed.

A darn of monofilamentous nylon is easy to insert at operation, reacts well to primary sepsis, has a negligible "delayed" reaction, provides a sounder and more permanent repair than most, being bettered by none, and is recommended as a good method for all varieties of hernia, whether strangulated, nonstrangulated, or recurrent.

WILLIAM E. NORTH, M.D.

In the life of a field surgeon there were unexpected relaxations. One day, eight out of the ten patients admitted to the field neurological hospital of which Harvey Cushing was in charge, suffered from strange and unfamiliar symptoms. The pupils of their eyes were large, they had hallucinations. On being questioned all of them admitted eating berries from an unknown bush four or five feet high. With a certain provisional diagnosis in his mind, Cushing and a fellow surgeon went off botanizing to look for the bush. Having no compass, they got lost in a beech wood. They wandered further and came across rusty barbed wire and huge shell craters in the muddy earth, and there, in the chalk below, Cushing picked up a fossilized bivalve and the jaw of a prehistoric ape-like animal. Near this they plucked some branches bearing berries, and ploughed on until they met a French soldier who pointed the way back to their hospital, and casually remarked that the berries they were carrying were poisonous and not to be eaten. Here was the solution of the mystery of those hallucinations. Even in the theatre of war, with shrapnel, gas shells and snipers' bullets that ordinary plant Belladonna, 'the deadly nightshade,' can be dangerous.

—*Williams*

IMPORTANT ANNOUNCEMENT

Contributors of scientific articles for publication in The Journal of the International College of Surgeons from Europe, the Near East and the Middle East should send their articles to:

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